The Builder.

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The Revelations of Early Christian Art.

It has been doubted whether it is possible to live in foreign cities and write aught, save news, for an English public. Absentees unwittingly fall into arrears in the currency of thought, tastes, and modes of expression. The protracted residence of Madame D'Arblay in France made a most marked difference in her style of composition. The change was so great that it is difficult to realise that the hazy pen that edited Dr. Burney's memoirs could be the same that created such an unparalleled sensation in literary circles but a few years before. The same influence was not without effect upon the writings of the chief poetess of the day, the late Mrs. Elizabeth Barrett Browning, which, the longer she lived in Italy, became more and more tinged with reflections of the foreign literature and circumstances with which she was surrounded; or, at all events, more estranged from her original manner. We have to notice this alien expression in the style of a work just published by the accomplished son of another of our celebrated poetesses, Mrs. Felicia Hemans.* Doubtless the long residence of Mr. Hemans in southern climes has been of inestimable service, if not of indispensable need, in the execution of the task he has performed, but it has not taken place without leaving an imprint of the fact upon his mode of expression. Long, entangled sentences, knotted with associations of idea, frequently obscure his meaning, as his opening passage instances; while a statement that has been verified at the expense of much research, or a subtle speculation, or an idea full of suggestions, is cramped into a parenthesis which is often enclosed in another. This peculiarity should not be allowed to prejudice the minds of readers against a work which is in reality of great interest, and which could have been executed only by dint of laborious effort. Research is a process wherein much time may be spent, and where the results are frequently negative. Exploration of ancient remains, too, is another undertaking which is often rewarded with scarcely more than negative results. A writer, therefore, whose work depends upon research and exploration, shows us but a part of his labours when his book is published. For every statement he is able to make he may have scrutinized a score of records, written in cramped characters, with faint ink, in a dead language, which did not furnish him with further information; for every monument he may have found bearing upon his subject, he may have examined a dozen fruitlessly. We must give Mr. Hemans credit for many such tedious investigations in channels that are closed save to erudition of a first-class order; and also make allowances for typographical errors which, with the character of the type, proclaim that his work has been printed by foreign hands.

Our author sets out with the intention of writing a history of early Christianity as handed down by early art. But specimens of ancient art not being sufficiently numerous for this purpose, he insensibly drifts into the use of the authority of ancient literature for his statements, and also avails himself largely of contemporary literature as well as of contemporary ceremonies. Thus biographies of the early pontiffs and Christian emperors, accounts of the origin of the monastic orders and of the Gothic and Greek wars, with a condensation of the principal events of the seventh, eighth, and ninth centuries, form a large part of the framework on which he spreads his canvas. A work on art without a single illustration is like a garden with no flowers in it. We feel that something is wanting. The organ of sight is kept in constant excitement, or hunger, without any concession to its necessities. Following so closely, too, upon the copiously illustrated works of Mrs. Jameson and Lady Eastlake upon sacred art, the loss is felt still more acutely, as every excellence achieved elevates our standard. Pursuing the historical thread of the work before us, however, we lose sight of this deficiency.

The result of Mr. Hemans's researches among the monuments and muniments of early Christianity upon his own mind is the conviction that, in the first years after the Crucifixion, the supreme and certain object of every gathering of the followers of the new faith was participation in the Eucharistic rite; and that the oftener we allow the celebration of this sacrament to drop out of our church services the farther we depart from the original motive for congregating together. According to this view, the Eucharistic rite should be the first essential in every service, instead of a periodical celebration: all worship, as well as teaching and ceremonial, should revolve round this mystic centre. But he is not quite clear as to his precedents. At page 43 he thinks the rite was of daily recurrence; later he states that it was not so, but in the second century was certainly held thrice a week, and always on the Sunday. Somewhat paradoxically, though he would rebuild the ritual of the church from this point, he would incorporate sentiments that he informs us have no expression in art till centuries have intervened, on the grounds that they have been entertained by the good and wise. Without going further into the particular convictions with which our author's mind has become imbued in the prosecution of his work amidst the gorgeous influence of Rome, we will confine ourselves more especially to the art-works to which he calls attention as illustrative of his theme. Unfortunately the objects that relate to the stay of the Apostles in Rome are deemed spurious, even the site of the martyrdom of St. Peter being contested by rival claims.

We must go back to that distant time when the Apostles have slowly and sadly turned their faces from Jerusalem, and are spreading themselves abroad preaching the new religion to which the stupendous seal has just been affixed. Two of them are in Rome. These are SS. Peter and Paul. Ciceroni show an impress left by the hand of St. Peter in the wall above the staircase in the Mamertine prisons, and another made by his knees in the church of San Francesca Romana; and, with still more daring flight of imagination, a foot-print of the Saviour. Mr. Hemans disclaims these, especially the latter, which he calls "an awkward attempt, quite unsuccessful in art." He directs us to look for more legitimate memorials of the Apostles in the two churches between which these relics were divided; and as these are the work of much later ages, we realize that association of idea is, in fact, all that Rome possesses of this period. The first early Christian architectural relic to which Mr. Hemans draws attention belongs to the third century,—this is the miniature basilica restored by Crescimbini, in the last century, from the effects of an inundation of the Tiber, which had rendered it inaccessible. It is believed to be the place of Christian worship consecrated by Pope Dionysius, between the years 261 and 272, within the confines of a Pagan temple. We now find it below a basilica first built with the remains of this edifice, in the eighth century, and rebuilt in the twelfth. It is a small, low, dark crypt, having sixteen arched niches around the walls. Mr. Hemans gives its measurement as 34 palms in length, and 17 palms in width. He describes it as having a flat stone roof immediately resting on the capitals of six columns, which display the rudest form of imitative Corinthian. The columns mark the boundaries of a narrow nave, with two aisles. At the end of one aisle there is a stone sedile; at the end of the other, a recess that may have served for a credence-table; and on the column nearest the altar, our author notes that he saw the remnant of an iron rod, for drawing curtains before the sacred table, "according to the early usage, that removed from public gaze all save particular passages in the Eucharistic sacrifice." The date of these fittings, however, Mr. Hemans can scarcely insist on. The arched recesses are only of sufficient height to allow of kneeling with the face turned to the wall. The only other noticeable feature in this interesting fabric is a small chamber behind the altar, now closed, which Crescimbini accounted for as having served for the sinking of veils or handkerchiefs from above upon the relics that were probably deposited here, as in the oratories and crypts of a later period. On Ash Wednesday only is there any public rite performed here, when, our author warns, there are such tasteless ornaments displayed, that its grave, simple character is injuriously affected. There is another crypt, which was used as an oratory in the early days of Christianity, under SS. Cosmo and Damiano, on the Forum. This is a "low-roofed cell, like a sepulchre," with a vaulting of stuccoed brick, and walls partly built of travertine, and the rest of brick. A third crypt occupies the site of the house of the Aquila and Prisca whom St. Paul mentions as his fellow labourers in Christ; where, however, the only object connected with these early times by reputation is a large Doric capital, which St. Peter is supposed to have used for the baptism of the tent-makers just mentioned, and other converts. Thus and always we find, that in art, as in nature, there has been continuity at work, rather than catastrophe.

The earliest objects associated with Christianity present no evidences of a new birth in art. Some centuries supervene before the departures from Pagan types are so remarkable as to constitute a new style. We have further evidence of this. Not only were the first churches adaptations of the basilica, but the first monasteries were planned upon the same principle as the antique Roman mansion. Fleury draws attention to this resemblance: "The church, which stands foremost so as to allow free access to seculars, occupies the place of that outer hall the ancients designated *atrium*, from which was entered a court surrounded by covered galleries, known as the *peristyle*, precisely corresponding to the cloisters we enter from our churches; whence we pass into other compartments, the chapter-house answering to the *exhedra*, the refectory to the triclinium of the ancients; and the garden, usually at the back of the edifice, is placed also like that of the antique residence." After contemplating this progression founded on continuity, there will be many who will accept the development theory as applied to architecture. But when applied to

* A History of Ancient Christianity and Sacred Art in Italy. By Charles I. Hemans. Williams & Norgate, Henrietta-street, Covent Garden, London, and South Frederick-street, Edinburgh; Goodban, Florence; Piale, Rome. 1866.

human thought, investigations into these early times only puzzle us. The sentiment of Cassiodorus, which Mr. Hemans properly remarks should be written in letters of gold, seems to have reversed the march of centuries. He wrote in the name of Theodoric, to whom he was State-secretary: "Since the Deity has permitted that more than one religion should exist, we dare not take upon ourselves the task of prescribing any one in particular, remembering that we have read that man ought to serve God voluntarily, and not by command of those who use force." This advanced thinker belonged to the fifth and sixth centuries, and was gathered to his fathers before the pontificate of Gregory I. raised the papacy to the position it maintained in the succeeding centuries. The continuity of progress has scarcely been maintained since this utterance.

We have mentioned these early remains particularly because they are not often visited by the architectural student; and, in this instance, they have been examined with a special object in view.

For the same reasons we will follow Mr. Hemans's steps through the catacombs. These he has looked at from three points of view:—first, by visiting them; then by examining such of their contents as have been removed to museums; and, also, through the medium of Rossi's great work on the subject, the first volume of which gives 1,374 examples. Even here, continuity in art is the most noticeable fact. There is no triumphant expression of the new doctrines in the early monuments in these subterranean depositaries; nor even any rendering of certain subjects which are now the most frequent of its phases, such as the Annunciation, the Last Supper, the Entombment, the Resurrection, and the Ascension. Feasts, or suppers, are, indeed, sometimes indicated in which the bread bears the mark of the Cross, but this is the *panis decussatus* of the Romans. Mr. Hemans is candid upon all these points, but scarcely sufficiently exegetical for practical purposes. The absence of any break is conclusively shown in the sculptures and paintings in the catacombs in which Pagan deities are mixed up with figures representing Christians, as in a banquet, quoted by Mr. Hemans, at which Irene and Agape wait upon the guests. The names of these two figures are written near them, so that there can be no incorrect interpretation here. The symbol representing the Trinity does not occur till what our author indefinitely calls "a comparatively late period;" nor does the now popular presentment of the Virgin and Child appear till the fourth century. It was not, indeed, till 431 years had elapsed that the Council of Ephesus elevated the Virgin to the pedestal she has since occupied in art by the famous declaration that she was not merely the Mother of Humanity, but of Deity in Christ. Neither is there any indication of prayers for the dead having been one of the recognised rites, nor of the doctrine of purgatory. But in all these matters sacred art, like sacred literature, is capable of being interpreted in different ways; and Mr. Hemans can see, for one, though no treatment of these subjects, a nucleus of feeling in some epitaphs which might naturally expand into ardent professions. He goes into the question of occupation of the catacombs by the early Christians as places of long-continued refuge; and thinks the evidence points to the conclusion that though they may have occasionally served as hiding-places for distingnished persons upon whom some price was set by persecuting authorities, they were not thronged with numerous inhabitants, as some legends would lead us to infer. There are no traces of such domestic residence. He also broaches the question of identity of these sepulchral corridors and chambers with Pagan *arenaria*; and follows Marchi in denying that the former could have possibly been, in any case, a continuance or enlargement of the latter, as the general scheme and dimensions differ so materially. But the fact that sepulchral chambers and passages were common to Pagan and Christians in the very heart of the civilized world, as well as to the semi-barbarous Scandinavians on its confines, has a deep meaning for anthropologists. The tendency of the uninformed human mind to exaggerate is seen in the computation of the number and extent of the Roman catacombs. The early writers, copying one another, mention sixty. De Rossi only finds forty-two, of which number only twenty-six are of great extent; and three of these are known to be of formation subsequent to the conversion of Constantine. The fourth century saw the transition from Paganism to Christianity still in course of progress. For a hundred and fifty-two temples in Rome looked down from antiquity upon but forty churches, and a hundred and eighty-three wayside chapels. Sacrifices were still offered in the former; mystic dances and songs enlivened the streets at Pagan festivals; crowds of devotees thronged to the temple of Æsculapius, and hung upon its walls offerings in thanksgiving for the recovery that often attended this exercise; the temple of Janus, with his threefold person, as Janus Geminus, Janus Father, and Janus Quirinus, was still open; and the rites of Cybele, "the Virgin mother of all the Gods," performed with an uproar that horrified St. Augustine, who wrote pithily:—"Miserable buffoons chanted before her car indecent verses such as it would be unbecoming, I do not say for the mother of the gods, but for the mother of any person respectable in quality, to hear." Another festival, the influence of which was not to be expunged from the new faith, was still in great popular favour. This was the Saturnalia, then named the Calends of January, and now known as the Carnival. One step, however, had been made. The oracles were dumb. And here we must quote Mr. Hemans to show his comprehensive charity and capacities for believing all things. He says,—"Whatever the degree of imposture and illusion, priestcraft or phantasm, mixed up with such agencies of olden idolatry, the idea of some supernatural element in the oracle-system scarcely deserves the contemptuous rejection it has often met with; but may be conjecturally admitted, when we consider how little we know of the spirit-world that surrounds us, and how unfathomable the mystery of the realities, perhaps removed but by a dim veil from our cognisance." There was, moreover, a stride made in architecture. The new plan carried out in the rebuilding of the Ostian basilica reversed many of the arrangements of the former structure: most notably, the supreme change from the west to the east in the performance of ceremonies. At St. Peter's and the Lateran, it will be remembered, the celebrants still face the west; but from the rebuilding of the third great basilica of this period the choir has occupied the east end all over Christendom. Mr. Hemans thus describes the new structure:—

"In this building's design the leading idea seems taken from the antique basilicas, with the adjunct of a transverse nave, giving to the whole a form like the letter T; central to which compartment was the 'confessional,' or apostolic shrine; the nave and four aisles being divided by columns, twenty in each file, in part the spoils from classic monuments,—perhaps (though this is uncertain) from Hadrian's Mausoleum,—but, for the rest, different in scale, material, and in the orders of the capitals and basements; the architectonic plan so strangely defective that even the intervening spaces were unequal! Instead of the architrave was preferred the surmounting arch—one step of progress since the building of St. Peter's; and above this arcade rose a very lofty attic, quite bare, till at a later period adorned with fresco portraits of the popes in chronologic order."

He, reverberatingly, mentions the basilica over and over again as the source whence the general plan of Christian edifices was taken. Of the numerous buildings erected by Constantine on his profession there is but one still standing in anything like its integrity; and this is the mausoleum of his daughter. His churches or basilicæ were built so hurriedly that they nearly all fell into ruin soon after his death. In the ancient St. Peter's there was, our author agrees, "but a barbaric attempt, though indeed imposing and venerable, in which was manifest rather the ruin of an ancient than the birth of a new style." Concerning this see early art brings clearly before us that St. Peter and St. Paul were considered co-founders of it of equal spiritual rank. In the catacomb of SS. Nereus and Achillus, in a group of the Saviour and his Apostles, these two are represented sitting while all the others are standing. In a fresco on the wall of a subterranean vault, supposed to be the oratory of St. Sylvester, the Saviour is represented between the same two apostles. Among other numerous instances they occur as medallions, facing each other, on a bronze in the Vatican Museum, taken from the Callixtan catacombs; and they appear on some of the glasses found in these sepulchres. Concerning this parity St. Ambrose wrote,—"It is indeed uncertain which of these can be preferred to the other; and I must deem them equal in merit as they were equal in martyrdom." St. Peter, however, as years roll on, gradually emerges from this equality and takes precedence of the impassioned Paul. As centuries pass over each other, art, reflective in the highest degree, shows how his successors altogether discarded his simple mode of life, wrought no more at tent-making, but gradually made footing in the company of kings. Mr. Hemans mentions, with characteristic richness and warmth of expression, the work of art which first indicates the high temporal rank assumed by the pontiffs:—

"In another mosaic, ordered by Leo III., was for the first time introduced royalty by the side of sanctity,—the image of a king associated with apostles,—curious evidence of that new position now formed for the papacy among secular potentates,—Charlemagne with diadem, jewelled mantle, and sword, together with the Pope in sacred vestments, and the chief apostles, now appearing in the church of S. Susanna, where, through the Vandalism of modern restorers, the historic art-work was destroyed in the year 1600."

It will be seen that the revelations of ancient art are historical, not doctrinal. They make us acquainted with nothing more of the habits of the early Christians than does the younger Pliny in his letter to Trajan. They "assemble on determined days at dawn of morning, to recite alternately hymns to Christ as God, binding themselves by oath not to commit crimes; not to defile themselves by frauds or adulteries; not to violate trust or deny deposits confided to them; after which they separate to convene again, in order to partake of promiscuous and innocent food." But the history of the false interpretations put upon the sacred story in different generations; of the absorption of many of the classic customs into Christian practice; of the gradual creation of a new style of architecture; of the supreme position eventually attained by the Papacy in the Middle Ages; in fine, of the literature, art, and politics of Christianity, has been told fervidly and feelingly by Mr. Hemans.

DESTRUCTION OF HAMPSTEAD HEATH.

Few things better repay examination, or more fully arrest the attention, than ancient maps. In these records of the past we can detect much that the limner quite unconsciously set down. We obtain indications of the taste of his age, of the social conditions and habits of thought of his day. Perhaps the spare corners of the sheet may be adorned with groups that preserve, with a truth the more incontrovertible in as much as the testimony of the draughtsman was spontaneous, the costume, the armour, or the heraldry of the day. With delineations, more or less accurate, of ancient boundaries, we find generally those conventional exhibitions of the nature and character of the country which have been displaced by our modern chorography. In such works as an ordnance map every line has a distinct value, and positively represents some natural object. Every incident of detail is accurately placed, and where, for the sake of distinctness of representation, exaggeration of scale is resorted to, as in the case of the width of roads, such distortion is not left to the caprice of private judgment, but is in accordance with theory and with rule. The contour lines of the large maps give definite information as to level. The shading of those on a smaller scale conveys similar information with less minuteness, but not with less attention to truth. A wood is not now represented by rows or sprinklings of sturdy cabbage-headed little trees. nor do we adorn the blank spaces of the hydrographer with imaginary marine monsters, or with the beauties of the court of Neptune. A marked and important change in accuracy of habit, and in the facility of applying correct delineation to the representation of nature is evinced by the improvement which the present century has effected in our maps. Nor, in referring to the minute elegance of our own draughtsmen, should we omit to pay due regard to the excellence of those physical charts, or rather quasi bird's-eye views, which find favour on the Continent, plans which so represent the features of a country as to enable the student to grasp its natural character with a truth and distinctness that maps covered with names, and constructed for the purpose of consultation by means of scale and dividers, can but feebly aid him to attain.

Of any series of plans that can be consulted there is none more worthy of attention than that of the maps of London. Mr. Crace tells us that there is no known plan or reliable view of London earlier than the sixteenth century. It is not, however, necessary to go back very far,—the difference between the London of our grandfathers and that of our day is enough to fill the imagination. Many of us can well remember when the immense Bayswater district was not,—as any part of the town; when the pioneers of the London and Birmingham Railway had their quarters at the Eyre Arms,

with hardly a house standing north-west of the Regent's Canal; when the present site of Eaton-square, known as the Five Fields, was lonely, and unsafe for foot-passengers after dusk. If we look at a map of the year 1760, we shall find London still more modest in its dimensions. The New-road to Islington ran wholly through fields, and the open country came down to the then healthy and airy site of the Foundling Hospital. London then, if we take its rate of increase since 1800 as our guide, contained less than half a million of inhabitants.* Its present growth demands a yearly revision of its map.

In this rapid and portentous growth of a metropolis, now covering 122 square miles, the jealous attention of those permanently interested in the welfare of the home of a sixth part of the inhabitants of England has been, from time to time, wisely directed to the preservation of those great breathing-spaces,—architectural lungs, as it were,—which are daily becoming of more vital importance. Hyde Park, we remember, has been so far held sacred, that the most novel, and one of the most beautiful structures of the century was cleared away from the site that was only lent for the Great Exhibition. Even the formation of a new road, or a new drive, through the Park is matter of diplomacy; and it is well that such should be the case, for, westward of Park and Gardens, cooping in and eating into Holland Park, girdled and regirdled with hideous lines of railway viaduct, horrid with shrieking engines, and veiled in clouds not only of steam but of smoke, London is closing in beyond Kensington, and speeding, almost as fast as a snail can crawl, down the western roads. We do well to secure the aid to purifying the atmosphere of London that is afforded by the parks, for the country air is now sadly de-ozonized before it reaches the elms and pines of Kensington.

But in another direction, towering over the sea of city life, as Mont Martre looks down upon Paris, lies a spot which of all others is precious to the health and dear to the memory of the Londoner. Within easy reach of groaning omnibus, or toiling cab, or sturdy and brisk pedestrian, is a region of heath and of sand, shaded in parts by ancient pines, and gladdened by the pure breath of the country. The sun, as far as we are acquainted with that luminary in England, looks down with but little obstruction on Hampstead Heath. The winds bound to its service at one step from Stanmore Common, leaving free beneath them the whole valley that pours its rainfall into the turbid torrent of the Brent. The late carouser at Jack Straw's Castle need no longer fear being stopped on his return to London by the boon companion who had applauded all his allusions to the decay of old English spirit by the repeated cry of "Them's my sentiments, sir; them's my sentiments, to a T;" but the name of the Vale of Health is still retained and still deserved. No greater calamity, of a physical character, can befall London than the covering of Hampstead Heath with buildings.

This calamity is not only imminent, but actual. After our wonted English habit, classical, no doubt, from and since the times of Ethelred the Unready, we have taken no steps to avert a great evil until it is bodily at our doors. We have been content with the dim belief that some legal impediment, unintelligible to any but the lawyers, but providentially invincible for an existing lifetime, existed to keep the sacred heath from the clutch of the builder; and perhaps the most patriotic and practical among us have prayed for the lengthened life of Sir Thomas Wilson. We have been content that the proprietor of the spot should be compelled vicariously to suffer, in purse, at least, for the health and amusement of the citizens of London, using the term in its widest, not in its technical sense; and, if we are honest, we must confess to a more or less open chuckle of satisfaction at the announcement, so often repeated, that the Wilson Building Bill has been again lost for the present session.

At last the cry of "wolf" is real. The builder is actually at work. An Irish invasion, not of riflemen but of hod-bearers, has established itself on the very glacis of the fortress of Jack Straw. "The first house," we are told by one who dates from the Grange, Hampstead Heath, "is in course of erection by the lord of the manor, at the flag-staff, the very point which commands the most magnificent of our views. Brickmaking is to be extended over a considerable portion of the heath, and the rest is to be covered with cottages and huts; in fact, another Agar or Kensal Town is to occupy this splendid site." The residents on the heath, very naturally, if somewhat tardily, convinced of the urgency of the danger, have been with deputations from Hampstead, Marylebone, Islington, and St. Pancras vestries, to urge the interference of the Metropolitan Board of Works, and, as far as appears from their statement, the effort has been made in vain. They now appeal to the public to raise their voice in favour of the carrying out of the recommendation of the House of Commons Committee in 1858 for concluding some equitable arrangement with the proprietors by which this most important site shall be kept free as a lung of London.

It is not easy to exaggerate the importance of this object. Every single individual resident in London, or partially resident in London, has a direct personal interest in the matter. No question of cost should be allowed to interfere, no sum that could be demanded, under the sanction of a Parliamentary power to grant a good title, would be worth consideration in comparison to the great injury to the health of the metropolis, and to the atmosphere breathed by the metropolitan population, that would be incurred by the loss of this most precious open space. Its conversion into a smoke-producing, deoxygenating crater, wafting a fresh canopy of foul vapour over the oppressed city whenever that which now is the purest and healthiest of our local winds may blow, would be felt, consciously or unconsciously, by every pedestrian in our streets, by every one who sleeps beneath a London roof. That the rate of mortality would be sensibly increased by the misfortune is, of course, only an opinion, but it is an opinion which naturally results from our statistical knowledge. And it must be remembered that an increased rate of mortality is not the only, nor perhaps the worst, evil that is produced by every fresh augmentation of the poisonous character of the atmosphere of a crowded city. There is much that makes life undesirable, without very materially shortening its duration. Head-ache, nausea, lassitude, indisposition to exertion, loss of appetite, nervous depression, aversion to business, disposition to dawdle and to fritter away life,—these and the like evils may be almost regarded as *functions* of atmospheric impurity. The effect of the loss of Hampstead Heath on the discomfort of the people of London would be greater than any possible statistical returns can enable us to measure.

What is every one's business, it is said, is no one's business. We trust in the present case it is not so. It may be the duty of the immediate residents and neighbours of the Heath to come forward in the first instance, to labour at effecting a nucleus of organization, to set the example of subscription. It is for the press, in all its ramifications; and, if there be a distinction, it is eminently for the scientific press, to give publicity to the danger, to place those who would resist it in ready and free communication. It is for the Government to avert this blow to the seat of the Legislature, of the executive, and of the Courts of Law; and to aid, and by gentle pressure, if need be, to force, the Government to do so, is the duty of every man who has the wit to see coming evil, the pluck to strive to avert it, and the confidence that he is not a mere insignificant and useless unit among the mass of animal consumers of oxygen.

* "Maitland," according to Pennant, "gives the total at the time of his publication, 1756, to have been 725,341. The increase of London since his days gives a probability that the enumeration is not much exaggerated." The only authorities, at this time, as to population were the parish clerks.

ART IN ITALY.

THE two committees for promoting the representation of Italy at the Paris Exhibition seem to prosecute their task with zeal and intelligence. On the motion of one of the councillors, Signor Salvagnoli, the Florentine Council have passed a resolution to frank to Paris and back twelve capable artisans, who shall be required to draw up their reports after the instructive tour, with the stimulant of two 500-franc prizes for the best such essays, as in a former case. The individuals to be thus favoured must be chosen and voted for by ballot out of an aggregate, twelve to be presented by each of the communal councils from the same industrious class; and it is desired that the elect twelve should represent severally the industries of leather, cotton and silk manufacture, of weaving, glass and wax-works, and metallurgy. For the expenses the council voted 10,000 francs, inclusive of the 1,000 for prizes,—not indeed enough to provide any luxuries of travel to those honest workmen. Another interposition of Prince Umberto has been in form of a proclamation, setting forth the importance to national honour and interest of the undertaking now so earnestly promoted, and dwelling upon the theme in a tone that has won general approbation from the Italian press.

In insisting upon the necessity that the arts of peace should now be especially cultivated, and social improvement aimed at by the nation, this document seems to bear a certain political character, and appreciates public circumstances aright. Another notification lately put forth by the chief committee, takes a review of the beneficial results to this country from the first great London Exhibition in 1851: the impulse therein given to the cultivation of cotton and to steel manufacture, the introduction secured for mosaics of Venetian glass and for Tuscan wood-carving in England, and the export trade opened for certain Italian wines, formerly scarcely known abroad. At the last Dublin Exhibition it is stated in this report, the articles of Italian produce sold brought the price of more than half a million francs; and another good consequence to this country from its successful concurrence in England, was the founding of the first Italian Industrial Museum, which thence originated. The municipality of Florence has been applied to by the same committee for pecuniary aid towards the promotion of objects so interesting to the national cause, but instead of at once voting a subvention, those magistrates appointed a board of councillors, to deliberate as to the extent to which they could co-operate or make sacrifices.

On the 16th of November was inaugurated the usual winter course of public lectures on belles lettres, philosophy, and science, at the Florentine Accademia, the opening address being made to a large audience by Donati, professor of astronomy. Interesting was the announcement with which the learned professor wound up his discourse on that morning, of the authoritative decision to found a new observatory, much ampler and worthier of the Italian capital than that Florence now possesses, the costs having been undertaken by the provincial council. And we see that that body has since voted 30,000 francs towards the new building, which is, we understand, to rise on some suitable eminence beyond the city walls. The other course of public lectures, alike kept up throughout the winter, at the Royal Museum, commenced about the same time, and now comprises the usual range of sciences, astronomy, physics, geology, botany, and metallurgy, but the chairs of chemistry and mining are vacant this season.

On the 25th of November was opened the annual Exhibition of Painting and Sculpture by the Florence "Society for the Encouragement of Fine Art." Four halls were filled with pictures, two with statues and busts on the premises of this Institution. We cannot say that our impressions have been generally favourable, or that this display has seemed, on the whole, worthier than in former years, when we have had occasion to report on the exhibitions of the same Society. It is noticeable, however, that several names among those of highest mark fail to appear among concurrents whose works are now brought forward. In the sculpture-rooms we do not find a single production from any of the studies most celebrated in this city: nothing by Dupré, or Fedi, or Santorelli, or Powers. A statue in gesso, above life-size, of Garibaldi seated on a rock in his island home, absorbed in serious and severe meditation, by Signor Pagliacetta (said to be his very first work), is full of individuality and truthful; indeed, the most striking among the aggregate. The boy "Giotto," sketching upon the ground, by Monti, is a pleasing figure; and a love-scene, apparently "Francesca da Rimini," by Cerri, of statuette proportions, is highly dramatic, but with the effect of painting rather than sculpture. Among the pictures are some good landscapes, and interesting specimens of the *genre* class; also not a few, sufficiently effective, from the suggestive sphere of Italian Mediæval or Cinque-cento annals. Of Dante and Petrarch we see quite enough, if not too much, both on canvas and in marble. Among the *genre* pieces are two, strikingly dramatic, by Rapisordi, who fails not to maintain his high reputation in this walk, and here presents a scene of love-declaration and another, its

contrary, styled "The Disillusionment of Love." The "Duomo of Milan," by Canella, is the best among numerous treatments of architectural exteriors and interiors. Such few sacred subjects as appear must be placed at the bottom of the list, — deplorable proofs of Italy's decline in the art-presentment of the religious Among novelties of the studio *not* at this exhibition, we may mention two ideal busts by Mr. Powers,—Faith and Hope, to be accompanied by the inseparable Charity, both expressive, and marked by a tender loveliness which this artist knows well how to give to his female subjects; also by another American, Mr. Ball, a statue, heroic size, of the tragedian Forrest, in the part of *Coriolanus*, ordered by some admirers at New York to be placed in a public hall at Philadelphia,—as to effect, a fine specimen of muscular humanity in classic disguise, but *not* an ancient Roman hero. More satisfactory is the same artist's sketch for a monument to the President Lincoln, with a slave crouching, yet looking up with a gleam of hope on his negro-face, at his protector's feet, and the last words from the Act of Emancipation inscribed on the basement as worthiest record of the illustrious victim.

The memorial of the annexation of Venice, placed in the Orcagna Loggia, consists of a St. Mark's Lion, in low relief, of dark grey stone, with the epigraph thus to be read, *Anglicé*,—"A record to posterity that on the 27th October, 1866, the Venetians, uniting themselves by unanimous vote, in this first comitia of liberty, to the Italian Kingdom, thereby secured its independence." Near this is hung a stone shield with the azure cross of Milan, and another inscription, referring to the gallant expulsion of the Austrians, in '48, as, "the signal for the first war of independence." But both these objects, however venerable from the patriot point of view, are too materially insignificant to add a feature at all noticeable to those grand arcades on Florence's most historic piazza. At the Pietra Dura (or Tuscan Mosaic) establishment is being prepared a magnificent table for Paris, with doves in the centre and various floral devices round the disc. Nothing more is said about the preparatory exhibition in this city of art works that pass muster before committees for the display at the French capital,—a project that came from the literary, not the artistic world.

Before the year closes Florence will have cast off the cincture of her old walls in at least the entire northern and north-western extent; and will have seen arise into partial completeness an ample new quarter of streets for the wealthier classes on the formerly unbuilt level between the Pinti and San Gallo gates, besides considerable enlarging, since this year opened, of the more fashionable quarter at the Lung' Arno extremity towards the Cascine. In style these new buildings show the prevalent modern Italian, with a good deal of stone facing and cornice-work, arched on triangular pediments to windows, and a general avoiding of monotony by adopting for each house in the street-line a different, or at least not uniform, design; but, except only in the Corsi palace, no attempt at the *grandios* or anything to impose by dimensions. An extramural road now being made beyond the Porta Romana, striking off along the high ground past Poggio Imperiale, promises to afford, perhaps, the pleasantest promenade in Florence.

ON STRIKES.

At the last meeting of the Statistical Society, Col. Sykes, M.P., presiding, a paper was read on "Combination and Strikes, with reference to Wages and the Conditions of Labour," by Mr. Jacob Waley, M.A. The following is an outline of the essay, which was attentively listened to by a crowded meeting of members. Mr. Waley first discussed the question whether strikes were in any case economically justifiable. He said that question must be answered in the negative if, in the nature of things, and under the operation of irreversible, economical laws, the labourer was incapable of obtaining, by means of a strike, any important advantages which could not more readily and beneficially be obtained by less violent means. This was a matter upon which the greatest possible differences of opinion still prevailed. So much of capital as was paid in wages was the fund to be divided amongst workmen. Its proportion to their number determined the rate of wages. Capital was attracted to a prosperous, and repelled from a declining trade; and the interest of the workman was therefore bound up with that of his trade. Capital and labour at variance were like two heads on the same stem, in perpetual conflict, notwithstanding their having common sensation. In a declining trade, a strike, by augmenting its disadvantages, might cause its ruin. Notwithstanding strikes, there was prodigious activity in the London building trades which could not be transferred to a foreign soil; and, in spite of them, coal, iron, pottery, and cotton industries flourished. In fluctuating trades, where there must be a large margin of uncertainty in the division of returns between profits and wages, a strike may advance the latter, perhaps permanently. It was difficult to say how far wages rose naturally with prosperity; and it would be well if employers would prove by examples that they did so. Reviewing certain strikes, and deducing inferences, Mr. Waley questioned the received mode of computing the losses of the workmen during a strike by adding the amount actually expended to the loss of wages. The money expended took the place of part of the wages which would have been earned. The contributors took upon themselves the loss represented by their contributions; the balance of the loss of wages fell upon the workmen on strike; but the aggregate of the workmen's loss was equal to the amount of wages which would have been earned, and no more. Having shown that historians of the strikes of the engineers, the Preston operatives, and the London builders, considered that the balance of advantage, consequent as well as immediate, was on the side of the men; Mr. Waley remarked that there were more solid and cogent reasons for preserving the integrity of the standard working-day than for abridging its duration. He saw no objection, but rather the reverse, to workmen directing their efforts to a reasonable and moderate reduction in the hours of labour instead of to a rise of wages. Referring to apprenticeship restrictions, he said it must appear strange that, after legal requirements had been removed, others should be voluntarily imposed; and they must have a pernicious effect in preventing the transfer of labour and in hindering the workman from bettering himself. On the whole, although apprenticeship might be sound as a practice, it was questionable whether it could afford a reasonable ground for combined workmen to make a stand upon against the masters, who, finding capital and running risk, must mainly control organization and industry. Whilst conceding that the power which combination conferred upon the workman was essential to his protection, it must be earnestly desired that that power should rarely be called into active exertion, that its effect should be felt rather in promoting peaceful solutions and averting contests than in provoking them or determining their issue. That in some districts strikes were so chronic, must arise from some serious unsoundness in the relations of employer and workman. Discussing remedies, he passed over courts of conciliation as inapplicable to a free bargain, and referred to the successful experiment at Methley Colliery, dividing profits above 10 per cent. with workmen, shareholders, and customers, which Messrs. Briggs found more profitable to themselves than their former plan of working. Messrs. Fox, Wood, & Co., of the Newport Rolling Mills, Middlesboro, had introduced a similar scheme, without making a joint stock company. These schemes did not go as far as ordinary co-operation, which might ultimately affect materially the organization of labour. Meanwhile, candour, good temper, and understanding of true relations must be relied upon. On the whole, he thought the following conclusions might be accepted as being in accordance with the facts:—The single workman is, when alone, no match for his employer. His weakness naturally leads to his combining with others having the same interest with himself. This combination may be legitimate though not confined to the workmen under one master, but much more extensive in its scope. The workmen of a trade may fairly combine for upholding common trade interests against a master or any number of masters. A strike, or the fear of a strike, is the last resort of workmen for enforcing a more favourable bargain with employers. Without the assistance of an extensive organisation by which funds could be collected from workmen in employment, and applied for the maintenance of workmen on strike, it would hardly be possible that a strike could be conducted to a favourable issue. Hence the connexion between trades unions and strikes. A strike for a rise of wages, or a reduction in the hours of labour, if made when the condition of trade renders such a demand reasonable, if not resorted to until peaceable means have failed, if carried on without violence or intimidation, is not necessarily to be condemned on economical or other grounds; but, as it is sure to inflict great loss and distress, and to impede the production of the wealth on which both employers and workmen must live, it should be regarded as a great calamity; it should not be undertaken without careful consideration of the circumstances of the trade, nor while there is a chance that the dispute may be amicably settled by peaceable means. Employers must consent to abandon the autocratic view of the position of the chiefs of industry; they must be forbearing and conciliatory in their relations with their workmen; they must recognise in the trades union a power co-ordinate with themselves, and consent to regard it as representing the workman in those matters on which the workman has a right to be heard,—such as his hours of labour and the salubrity of the factory in which he works. On the other hand, they are not bound to admit of the interposition of the society as to any matters not immediately connected with the remuneration, health, and comfort of the workman. Workmen, both individually and when connected in trade societies, must bear in mind that they have a common interest with their employers as well as a separate interest. Both are interested in the augmentation of the trade resources which form the fund to be shared between them, and it is only when the apportionment takes place that there is room for variance. Trade unions must avoid meddling and officious interference, as those whose means keep industry going, and who run the risks attendant on industrial undertakings, must be left to control and discipline industry. Unions must cease to assume that there is an antagonism between them and the masters, and must bear in mind that they are doing their constituents incalculable mischief when they hinder the growth and impair the prosperity of the trade to which they belong. They must keep to their own function, that is, the protection of trade interests and the due administration of their common funds. Their action for political objects can only be fatal to their efficiency for the purposes for which they were formed. Above all, they must respect the freedom of others, whether masters or workmen. Only when they abstain from coercion, rely on the free and voluntary support of their members, and forbear to interfere with the liberty of others, can they expect to win respect or support from enlightened opinions. In the ensuing discussion the views of Mr. Waley were generally endorsed.

PRESERVATION OF FRESCO PAINTINGS.

The substances employed, says the *Dingler's Polytechnisches* Journal, for the preservation of fresco paintings, should satisfy the twofold condition of protecting them from the effects of the atmosphere, and of giving them transparency, so that they may have a warmer aspect. Soluble glass has been proposed, and even in a certain measure employed, for this purpose. But M. Kaulbach, of Munich, whose opinion in this matter has certainly much weight, has pronounced against the use of glass for ancient as well as new frescoes; and M. Vohl, after having made some experiments, completely agrees with him. If we consider attentively the composition, the properties, and the reactions of soluble glass upon a substance containing lime, we observe that this glass, being a combination of silicic acid, with an alcali (soda or potash), exerts a powerful alcaline reaction, and is decomposed, in contact with the calcareous salts, so as to form a silicate of lime, leaving a certain quantity of alcali at liberty, which afterwards combines with the carbonic acid of the air.

If, then, a fresco painting be coated with silicate of potash, this alcali becomes free, attracts the carbonic acid of the atmosphere, and forms a salt, which, even in a neutral state, is deliquescent, and renders the wall damp. After a lapse, however, of some time, this salt having absorbed a fresh quantity of carbonic acid, is changed into the bicarbonate of potash, which no longer absorbs the humidity of the air, effloresces in minute crystals, and separates from the wall. The thin coating of silicate of lime, with an excess of acid, soon crystallises and scales off,

taking with it a portion of the colour. If the soluble glass has been prepared with soda, the same reactions take place, except that in very dry and warm days, especially in summer, the carbonate of soda effloresces in a remarkable manner, and covers the wall with a white crystalline mass, like mould, which in falling off detaches the colour and gradually destroys the painting. It is only at first that the water-glass consolidates the frescoes; afterwards its tendency is, more and more, to destroy the painting. The successive effects can be observed in the church of Saint-Gereon at Cologne. In several cases, when sulphuret of arsenic or different oxides of copper enter into the composition of the colours employed, the alkali of the water-glass can alter and even destroy the colours. The process which, in most cases, has been employed by preference, and which not only consolidates but preserves the fresco paintings, and renders them more transparent, brilliant, and warm, consists in the employment of a solution of a neutral soap of wax in alcohol, or of wax in benzine. The first of these solutions allows a brilliant polish to be given to the walls; the colours are well brought out and become solid and durable. The only inconvenience arising from this treatment is, that in damp edifices the layer of varnish soon takes a yellow hue, darkens the lighter tints of the painting, and varies on different points the shade of the colours. This process was known for a very long period in Italy, especially at Herculaneum and Pompeii. For many years M. Vohl has attempted, with much success, to employ for the same use a solution of pure paraffine in benzine, or in Canada oil. One of these volatile oils is saturated with the paraffine, and the solution is spread over the fresco. When the dissolvent has evaporated a brilliant polish is given to the painting by rubbing it moderately with a brush or a fine cloth. This method is more economical than the employment of wax or of wax soap, and the coating does not turn brown. M. Hohe, professor at the academy of Bonn, has tried it, with much advantage, since the year 1861, especially upon the frescoes of the church of Schwarzrheindorf, near Beuel.

THE ROYAL ARMS OF ENGLAND.

ROYAL AND NATIONAL HERALDRY OF ENGLAND.

AT the meeting of the Architectural Association, held at the House, in Conduit-street, on Friday evening, the 7th inst., Mr. R. Phené Spiers, Vice-President, in the chair,—

The Rev. C. Boutell called attention to the royal and national heraldry of England, and commented upon its importance in connexion with architecture. He observed that the authorities for heraldry were ancient rolls of arms,—records written many centuries since, proved by internal and external evidence, ancient seals, which latter were regarded as valuable aids to the study of heraldry, and in olden times were considered of great importance in a legal sense, and monuments and architectural remains. A good deal of heraldry was invented before good heraldry was known, and it was attributed to people who flourished and died in earlier periods. The earliest seal known was that of Prince John, before his accession to the throne. The next example was the first great seal of Richard Cœur de Lion, and then came his second great seal, showing the three lions as they appeared in the royal arms in our own day. The golden lion on a red ground was the lion of England. It appeared upon the great seals of Henry III. and Richard I. The French of that time not being disposed to be complimentary to us, called our lion a leopard. They could not understand a lion in any form except as a lion rampant, with its paws up ready to spring upon its prey. They drew a lion in a different position, and called him a "leopard," or *leon leopardi*, because he had his feet on the ground. The first important department of heraldry was called "differencing." In the reign of Henry III. it became necessary to distinguish his arms from those of his son Edward I., who was the first to use a riband, or label, with points. This he put over the shield displaying the royal arms. The earliest distinguishing label was invented by the first Earl of Lancaster, who took the same kind of label as his elder brother, but inscribed it with the *fleur de lys*, to show that he had married a member of the royal family of France. Further distinctions subsequently became necessary as the branches of the house expanded. The younger brother of Edward III. (John of Eltham) had for his arms three lions, with the border of France. This insignia was to be seen on his tomb in Westminster Abbey, where it still remains in as fine preservation as if sculptured but yesterday. Edward III. claiming to be King of France as well as of England, assumed the royal arms of both countries in equal proportions. These combinations might be observed in Westminster Abbey, attached to the hammer-beams of Westminster-hall, and also over the doorway of the hall, outside. Coming to the middle of the fourteenth century, the Prince of Wales, in order to distinguish his arms from those of the crown, put a white label of three points over the national shield. This first Prince of Wales (the Black Prince) had two shields, which he described in his will as his shield of war and his shield of peace. The latter was a black shield, with three white ostrich feathers on it, and it was still to be seen on his monument in the cathedral of Canterbury. The origin of a plume of ostrich feathers as the insignia of the Prince of Wales was involved in obscurity. The earliest record of it was an engraving on a piece of plate belonging to Queen Philippa, the mother of the Black Prince. The latter assumed the ostrich feather on his seal and upon several of his shields. The King of France, not highly approving of the use of his arms by the King of England, made an alteration in his shield, by reducing the number of *fleurs de lys* to three. The arms of the Prince of Wales's eldest son were similar to those of Edward II.; but on the centre point of the white label of three points was the red cross of St. George, and this was the shield of the infant son of our own Prince of Wales at this moment. Mr. Boutell next traced the manner in which the arms of Scotland and of Ireland came to be quartered with those of England, and how the arms of Hanover were subsequently added. An illustration was, he said, still to be found over a shop-door in a court on the right-hand side of Ludgate-hill. It was, he remarked, somewhat singular, that although the title of the heir to the Crown was derived from Wales, the arms of the principality were not borne by the Prince of Wales. This was an extraordinary circumstance, which heralds were wholly unable to explain. He suggested that the royal arms were susceptible of a useful alteration, by omitting as the fourth quartering a repetition of the first (the three lions) and substituting the arms of the colonies or of the principality. The quartering then would be England with her three lions, Scotland with her lion rampant, Ireland with her golden harp, and, lastly, the arms of Wales. The colonies might subsequently be represented by a small shield, or, in heraldic language, a pretence, affixed to the centre of the shield, as was done in the case of Hanover when that country was a possession of England. The rev. gentleman next referred to the flags of the three countries, pointing out how the Union Jack had been dexterously formed out of a combination of the St. George's Cross of England, the Irish Cross, and the St. Andrew's Cross of Scotland. He also pointed out the manner in which modern heralds, following in the line of precedent, had distinguished the younger branches of the Royal family of England. Thus the Prince of Wales had a silver label of three points; the Princess Royal a label with a St. George's Cross on the dexter and sinister point and a rose in the centre; the Prince Alfred two anchors and a St. George's Cross; the Princess Alice, the Ermine spots and a rose in the centre; the Prince Arthur, two *fleurs de lys* and a St. George's Cross in the centre; the Princess Helena, two roses and a St. George's Cross in the centre; the Prince Leopold, two hearts and a St. George's Cross in the centre; the Princess Louisa, two cantons and a rose in the centre; and the Princess Beatrice two roses and a heart in the centre. The insignia of the Duke of Cambridge consisted of a label of three points, with two hearts on each, and a St. George's Cross in the centre. He also called attention to a drawing of a curious slab of marble found at Venice, with the face downwards, bearing the armorial insignia of Henry of Lancaster, afterwards King Henry IV., which was brought to this country by one of the Howard family, who fancied it was intended for the Norfolks, with whom he was connected; whereas it belonged to the bitter enemy of that house. In conclusion, he recommended the student of architecture to make heraldry subservient to ornamental design, taking care that the heraldry was true, and that the architecture, like the heraldry, proclaimed its own tale and time.

THE STUDY OF INDIAN ARCHITECTURE.

MR. FERGUSSON read a paper on this subject at the Society of Arts, on the 19th inst., and went over some of the points that have been treated of at different times in our pages. He showed how little Indian architecture is known in England, the value of the remains, and the importance of preserving them. In conclusion, he said,—

I consider the study of Indian architecture important because it affords the readiest and most direct means of ascertaining the ethnological relations of the different races inhabiting India. It points out more clearly than can be done by other means how they succeeded each other, where they settled, how they mixed, or when they were absorbed.

In the next place, I consider it important, because it affords the best picture of the religious faiths of the country, showing how and when they arose, how they became corrupted, and when and by what steps they sank to their present level.

It is also, I believe, important because in a country which has no written histories it affords almost the only means that exist for steadying any conclusion we may arrive at, and is a measure of the greatness or decay of the dynasties that ruled that country in ancient times.

These considerations refer wholly to India, and to the importance of the study as bearing on Indian questions only; but I consider it as important, also, because of its bearings on architectural art in our own country. First, because by widening the base of our observations and extending our views to a style wholly different from our own, we are able to look at architecture from a new and outside point of view, and by doing this to master principles which are wholly hidden from those whose study is confined to one style so mixed up with adventitious associations as our local styles inevitably are.

It is also important because architecture in India is still a living art. We can see there, at the present day, buildings as important in size as our mediæval cathedrals, erected by master masons on precisely the same principle and in the same manner that guided our mediæval masons to such glorious results.

It also is, I conceive, important as offering many suggestions which, if adopted in a modified form, might tend considerably to the improvement of our own architectural designs.

Lastly, I consider the study worthy of attention from the light it may be expected to throw on some of our own archæological problems."

In the discussion that followed,—

Mr. Henry Cole, C.B., remarked that, if anything were wanting to convince Englishmen how much there was in India of which they were ignorant, it was the able paper they had heard this evening. He thought it hardly too much to say that there were scarcely half a dozen architects in this country who could pass even a preliminary examination in Indian architecture; and yet here was the great fact before them that there was an architecture, whether beautiful or ugly did not affect the question, which might be said to be the history of a people living in a state of considerable civilization even 500 years before the Christian era. That the architects of this country should know very little about Indian architecture was not surprising when they recollected that even within the memory of members not older than himself, they knew very little about Gothic architecture. Fifty years ago nobody knew anything about Gothic architecture; and he remembered being sent to look at the new church of St. Luke's, Chelsea, as something wonderful and novel; and yet they knew how great a revival there had been in that branch of art. If such had been the case with Gothic architecture, he thought that eventually they might hope to have some knowledge, at least, of the architecture of India. Not more than 100 years ago, Horace Walpole built that structure which was then thought to be excellent Gothic, at Strawberry-hill; and scarcely fifty years had elapsed since Wyatt, in Durham Cathedral, exercised his taste in what he considered to be Gothic; and yet, at the present time, there was not an architect's pupil who would not consider himself disgraced if he had produced such work. He therefore did not despair of seeing Indian architecture studied in this country; but he wished to be understood that he did not desire to see it copied. While upon this subject, he might mention that visitors to Paris next year would see a building in con-

nexion with the Exhibition there, the design of which was somewhat in the form of a Mohammedan temple, suggested by Mr. Hope's book on architecture. In the English department of that Exhibition it had been found necessary to erect a building to contain several boilers, which were, in the first place, to be exhibited as specimens of manufacture, and also to be used to drive the machinery. Of course, in connexion with the boilers there must be chimneys, and it was desired to have them ornamental; the building must also be extremely airy, so as to make it as cool as possible. Looking over Mr. Hope's work on architecture, they found a representation of a mosque of which Syeed Ossman was said to have been the builder, and this gave them, in addition to extremely ornamental forms, like chimneys, colonnades, which afforded open spaces for the public to inspect the boilers in. It was most remarkable how much influence the display of Indian productions shown in the Exhibition of 1851, had had upon our taste, especially in the manufacture of carpets and other fabrics. Mr. Peter Graham, a competent witness, was present, and could testify to this. Instead of flaring patterns in perspective, they had decorous flat patterns, on which they could place furniture without feelings of discomfort, and it was the fact that a large trade had since been established in Masulipatam carpets. The same influence, he believed, would ultimately be exerted by the architecture as by the manufactures of India. He also remembered that in the Exhibition of 1851, whilst they had these beautiful patterns designed by the benighted people of India, there were beside them some most abominable imitations of European patterns. Indeed, there was nothing so bad as when an Indian attempted to copy European art; and he confessed he had some fear lest the schools of design in Calcutta, Madras, and Bombay, instead of leading the natives to advance in their own styles of art, would create a hybrid style, the most detestable ever seen. In his opinion, we had a great deal more to learn from the Indians than we could hope to teach them in the designing of patterns, and he protested against schools of art in India, which should corrupt native talent and taste. Mr. Fergusson had alluded to the importance of having some kind of systematic mode of collecting information on the architecture of India. He was quite sure, supposing they none of them cared at all about art, they must nevertheless feel an interest in the millions of human beings who were at present subjects of Queen Victoria, and must long to know something about this remarkable people. He would ask how that rude cross and cromlech, shown in a diagram on the walls, could have got into the place where it was described to have been found? It was a veritable duplicate of Kit's Cotty-house in Kent, and yet it was in the midst of a dense jungle. Let them try and penetrate the history of such things as these. Mr. Fergusson had suggested that they should go on systematically obtaining photographic representations of objects of art in India. He (Mr. Cole) hoped some plan would be arranged by which we might be able to have in this country a systematic collection of photographs of Indian buildings; there were already skilful photographers high up the hills in India, who were in possession of thousands of these photographs, and he hoped we should soon see them in this country. He was enabled to state that it was intended that in the Indian court of the Paris Exhibition, Indian architecture should be represented. In addition to photographs, he would suggest casts. Only the difficulty of cost, which Englishmen very soon overcame, stood in the way of procuring casts of all the typical buildings of India. The public money had been already employed in obtaining casts of the finest objects in Italy, Spain, and France. We had recently imported into this country, at a cost of between 2,000*l.* and 3,000*l.*, a cast of the beautiful gate of the convent of Santiago, in Spain; and if we were to have these casts from Spain, it would be well to have them from India also. If the Society would, at a future time, again take up an idea they once had, and hold a complete Indian exhibition, embracing a proper representation of architecture, coupled, perhaps, with a complete colonial exhibition, he believed a most interesting and valuable display would result. On the previous occasion, in the year 1852, there was great difficulty in providing a building for the exhibition, but that difficulty would in a year or two be removed. There would then be in existence a building, the great Central Hall, which would be sufficiently large to accommodate an exhibition of this kind, besides a good many other things.

Colonel Scott, R.E., asked Mr. Fergusson to what extent he considered the architecture of any one of these races of India had influenced the architecture of the race that succeeded it, and whether in the architecture of the present day any purer system was followed, or whether what was styled by Mr. Cole a hybrid character of architecture now prevailed in India?

Mr. Fergusson replied, the styles in India had changed like those in this country, but each was a complete indication of the race of people to which it belonged. Each style differed from the preceding one, but was entirely without foreign admixture; and when they were familiar with the whole, the ethnology of the people was distinctly to be traced in the different styles. Where European influences prevailed architecturally, as in Lucknow and Hyderabad, the style had become corrupt and bad to the last degree.

Mr. J. Crawfurd said he would not attempt any criticism of the interesting paper read by Mr. Fergusson. Indeed he was not competent to do so; for Mr. Fergusson certainly was the best-informed man in the country on the subject he had brought before them. There were some points, however, on which he entirely differed from him. For instance, the Aryan theory he utterly disputed. Mr. Fergusson would have it that India was chiefly peopled from abroad, but that he (Mr. Crawfurd) did not believe. He believed that Nature made India a fertile country, and peopled it just as every other portion of the world was peopled. That there had been invasions of India in different ages there could be no doubt, and the invading tribes soon became merged in the native population. Mr. Cole had argued that we knew nothing of India except through the price currents of the markets; but he (Mr. Crawfurd) entirely dissented from this, and contended that we knew a great deal about India. Mr. Cole had, perhaps, not made it his study, but many persons had devoted the best part of their lives to the subject, and ought to know something about it, if they did not. The architecture of India was certainly wonderful and curious, though he thought not very beautiful or graceful; and he contended that we were a more advanced people in this respect than those of India. He was not for imitating Indian architecture; but in many respects they might well imitate our architecture, and, for his part, he believed they would improve in proportion as they imitated it. Very much remained to be done in the way of improving domestic architecture in India. Their temples were large and gorgeous, but they had, in fact, no domestic architecture, and their dwellings were mere huts. All that had been done in the way of architecture had been bestowed upon their false gods; and he knew of no Indian architecture except that which was of a religious character.

Mr. Peter Graham said, Mr. Cole having appealed to him with regard to the influence exerted upon the manufactures of this country by the Indian department of the Exhibition of 1851, he had no hesitation in stating he entirely concurred in the views of that gentleman. Followed up as that was by the exhibition at Marlborough House, for which he believed they were mainly indebted to the personal exertions of Mr. Cole, a great and beneficial influence had been exercised upon the taste not only of manufacturers, but the public at large. He believed he was warranted in saying that in the choicest specimens of ornamentation of the *cinque-cento* period there might be traced an influence derived from eastern objects of art that had been seen by the artists of that period. This could be discerned most distinctly; and he thought they could not do better than study those works—he did not mean as copyists—but as affording suggestions by which taste in the manufactures of this country might be improved.

Mr. Robert Rawlinson, C.B., said that when he looked at the numerous photographic representations of these buildings on the walls of the room, and while listening to the eloquent remarks of Mr. Fergusson with regard to them, he could not but ask himself the question—what was the purpose and utility of such large structures as these? And when they were called on to admire them as beautiful pieces of construction, they could only do so by considering the kind of people who constructed them, the climate in which they were placed, and the purposes they were applied to. He must express his opinion that architects even at the present day did not sufficiently consider what were the purposes for which their buildings were required. Huge public buildings were erected, and subsequently certain "dodges" had to be resorted to to make them habitable. That was especially the case in the Treasury-buildings, where all sorts of contrivances were resorted to to produce ventilation; and looking at the outside of the houses in London generally, they could not but notice all kinds of hideous appliances employed to induce the smoke to go up the chimneys. As a sanitary engineer, he felt that before they went to the study of Indian architecture they should learn to perfect their architecture at home, and make it really useful. Looking at the representation of the great Dravidian Temple, he had no hesitation in saying, in a sanitary point of view, it was an abomination, though possibly it might have architectural merits. It could not be lighted as it should be, nor could it be sufficiently ventilated. At the same time many valuable lessons might be learned from the East, especially their mode of making and arranging tiles, of using mortar, and of construction generally. The employing architects and engineers, and allowing them to send out articles from this country for use in India, was an enormous waste of the public money. He knew that many things sent out from this country to India served no better purpose than affording a good commission to the parties who gave the orders for them. In waterworks construction it was evident that the Hindoos were in advance of us. There were reservoirs in India 2,000 years old, and we might learn a lesson from them in this respect. A water supply, however, was about to be provided for Calcutta by a conduit fourteen or fifteen miles in length, from the Hooghly into the city. It would hardly be believed that that conduit was to consist of cast-iron pipes, sent from this country, to be laid in a marshy subsoil full of salts, where it could only last about twenty years. If that conduit had been built of Hindoo bricks, by Hindoo workmen, it would have been executed at half the cost, and might have lasted 2,000 years. He happened to know that in India there was a vast deal to be done in the way of building, of various kinds, for years to come. There was an army to be maintained at less cost of life than was the case at present, and several millions of money were to be spent in providing adequate barrack accommodation and improving the military stations of the country. He did not think it was a wise step to turn attention to these disused temples for hints as to the best mode of construction, but he did think the works should be constructed of native materials and by native labour, though upon the best plans that modern civilization could suggest.

Mr. J. Beavington Atkinson said the subject introduced this evening suggested one or two inquiries. The first was, how far the Mohammedan architecture, of which there were such beautiful examples in the room, could strictly be called Hindoo. The date of that architecture was 1200 of our era. They were perfectly well acquainted with it in other portions of Asia, and also in some parts of Europe. They knew what it was in Cairo and Constantinople, and also in Spain. The Mohammedan architecture which they found in India was, he ventured to say, except in some minute details, that which was known as Arabian architecture, planted in a new soil. They had the glorious dome and pointed arch peculiar to that architecture, which gave it a significant character wherever it was seen. The term, with regard to the ethnology of architecture, that was a very vague and conjectural term; and he ventured to ask whether, in order to get at anything like the origin of Indian architecture, they must not go back to a date far anterior to that of the oldest building represented by these photographs. If he had rightly read the works of Mr. Fergusson, he believed the earliest building of which they had a record was something like 250 years before Christ; whereas Thebes and Memphis were supposed to have been founded 2,000 years before Christ, and Rome 750 years; whilst the great period of the Greeks was, he believed, nearly contemporaneous with some of the photographs exhibited. Therefore, he would ask Mr. Fergusson how much further it was possible to go back in chronology in order to arrive at the ethnography of the arts of India, and whether, between the Eastern and Western architectures, there could be traced any correspondence as to the details. As to the exact merits and position of Indian architecture, it would be presumption in him to offer an opinion. One criterion of merit

in architecture was the relative perfection of the figures employed in decoration. Supposing these buildings to be contemporaneous, or nearly so, with the Greek temples, their artistic position would be somewhat indicated by the drawing and modelling of the figures in these façades as compared with the great Grecian works of art.

Mr. Philip Palmer remarked that the late Sir Joseph Paxton, in his plan of the Exhibition building in Hyde Park, illustrated the principle of building by the multiplication of parts; but, if he understood Mr. Rawlinson rightly, he appeared to think that a building of that form could not be well lighted and ventilated. They could hardly expect glass to be used in such structures in India; but it had been shown that in this country it was possible to erect buildings on that principle, and at the same time to secure thorough lighting and ventilation.

Mr. Fergusson, in reply upon the discussion, said Mr. Rawlinson laboured under a mistake in the views he had expressed relative to the square form of temple he referred to. It was impossible within the limits of a paper to point out all the details, but there were no separate apartments in the building, as Mr. Rawlinson had supposed; but the building, of which the plan was given on p. 74, was, in fact, a vast porch, standing on fifty-six pillars, and was perfectly open, the ventilation being of course admirable. The Dravidian Temple belonged to a different style of architecture and a different age altogether. He had endeavoured to make it clear that he by no means wished these productions to be copied. All he said was that there were principles in these buildings which were worthy of the study of architects, and it was by going to foreign styles, where they were not hampered by association, that they could most clearly understand what the true principles of architecture were. With regard to the remarks of Mr. Crawfurd, as to the absence of domestic architecture in India, that gentleman must surely be aware of the existence of numerous large and beautiful palaces which, in point of form and ornamentation, were equal to anything in Europe. In reply to the question of Mr. Atkinson, as to how far Mohammedan architecture was Hindoo, and why he had applied the term Mohammedan to it, he would refer to the circumstance that when the Mohammedans went to Constantinople they did not take with them the architects of Cairo, Syria, Spain, or Persia, but they literally copied the church of St. Sophia, which they found there, in the works which they erected in that city. Wherever the Mohammedans went, they introduced no style of their own, but employed the native people to build their mosques for them; and this accounted for the fact that some of the most beautiful Mohammedan buildings in India were purely Hindoo from first to last. With regard to the ethnography of the buildings, he could not in India get beyond 250 years before Christ; but, as far as general knowledge on the subject went, from the building of the first pyramid in Egypt down to the present day in India, and down to the thirteenth century in Europe, there was not a single building which did not more or less mark the ethnography of the people who built it. What gave the architecture greater interest was the fact that they could trace this ethnological relation not only in India but also in Africa and China, and other parts of the world. Indian architecture itself formed but a small branch of this subject, though a pleasing and important one, because, from the want of inter-communication, they retained their peculiar idiosyncrasies to a larger extent and more distinctly than any other people he knew.

OPENING OF THE NEW RAILWAY BRIDGE AT BATTERSEA.

THE bridge which spans the Thames from Battersea to Pimlico has been opened for traffic. According to the plans of Sir Charles Fox, the new structure has four river spans of 175 ft. each, and two land openings at each end of 70 ft. The river openings are segmental in shape, and the ribs of wrought iron have a rise of 17 ft. The three piers in the river have each at the level of the springing of the ribs a thickness of 12½ ft., and the two abutments are 20 ft. thick each at that level, so that the total length of the whole bridge is about 310 yards. The width of the bridge at rails level is 110 ft., wide enough for eight lines of rails, and this width is carried by seven main ribs to each span. The abutments have been carried down to a depth of over 15 ft. below low-water mark, with brickwork in cement, and the excavations for the abutments, owing to the great width of the bridge and form of ribs, had to be 125 ft. long and 48 ft. wide. The piers are supported by brickwork in cylinders, four in number, being sunk to a depth of 45½ ft. below high-water mark. Each is 21 ft. in diameter, and made of cast-iron in lengths of 8 ft.; each length composed of eight segments. The length of each pier at the level of the cylinders is 130 ft. The weight of iron in the superstructure and cylinders, &c., is estimated at about 3,000 tons. 100,000 cubic feet of stone have been used; 16,000 cubic feet of brickwork, and about 300,000 cubic feet of timber. Each of the cylinders has been weighted with a load of 1,000 tons to test the foundations, and at low-water mark cast-iron girders are fixed between them and the existing pier. The parapet on the east side of the old bridge has been removed, and placed on the new one. The new bridge is about 52 ft. wider than Westminster Bridge.

FROM SCOTLAND.

Greenock.—The sugar refinery of Messrs. Dawson, Martin, & Co., Greenock, in which a valuable stock of sugar was stored, has been burned down, the damage done being estimated at 25,000*l.*, which is covered by insurance. It is thought that the catastrophe was occasioned by an escape of gas in the fifth story.

Alloa.—Some time ago the Commissioners of the burgh of Alloa accepted from Mr. William Kerr, Helensburgh, a contract to construct new waterworks, at a cost of 2,500*l.*, with the view of bringing a more plentiful supply of pure water to the town. It was expected that by this time the works would have been far advanced towards completion, but a difference of opinion has arisen as to the weight of pipes to be used, and there is not much appearance of the civic rulers and the contractors effecting an amicable adjustment of their dispute.

THE TRADES MOVEMENT.

Birmingham.—The master builders have collectively issued a notice,—affecting alike the journeymen stonemasons, bricklayers, carpenters and joiners, painters and glaziers, plumbers, plasterers, and labourers,—stating that, after the 1st of May, they intend to enforce a new code of regulations instead of the rules now in force. The masters have not only agreed among themselves what the hours of labour are to be, but they declare that henceforth they intend to let piecework, take apprentices, and use any machinery or implements they require, so as to manage their own business in their own way.

Carlisle.—The masons have now been eight months on strike, with as little prospect of success as ever; the masters having got their contracts sufficiently forward to secure their work for the winter.

THE METROPOLITAN MEAT AND POULTRY MARKETS, SMITHFIELD.

MANY of our readers must have observed the labyrinth of hoarding which, for a considerable time past, has changed the appearance of Smithfield and its surroundings; and some may have been led to suppose, by the premature notices of the daily press, that these were connected with the proposed meat-markets. Such, however, is not the case, the works at present in progress being the extensive excavations for the railway depôt (scene of a recent sad accident), which will occupy the basement of the market buildings, and will have to be nearly completed before the market can be proceeded with. Much delay has already taken place on account of these railway operations, but they are now being pushed forward with more energy; and it is to be hoped that no further cause of delay may arise to prevent the corporation carrying out this very desirable work with all expedition. With the aid of the City architect, Mr. Horace Jones, we are enabled to present our readers thus early with the accompanying view of the exterior of the proposed building, and a section of the interior of the roadway which intersects it, from which its large extent and character may be judged of.

The suitableness of its arrangements will be best understood by the following description.

As we have already indicated, the market buildings will be constructed over the joint depôt of the Metropolitan and Great Western Railways, on the north side of old Smithfield market-place. The block of the buildings will be oblong, the greater length extending from east to west. The south front will be in the line of Long-lane and King-street, and a road will be formed in a line with the north front, to join Farringdon-road. A roadway, 50 ft. wide in the clear, will also pass transversely through the centre of the market-building, connecting Smithfield with the important thoroughfares of St. John-street and Cow Cross-street to the north.

The proposed building will be 631 ft. from east to west, and 246 ft. wide; the area enclosed will therefore be 155,226 ft. super., or somewhat more than three acres and a half.

The general plan shows a central avenue, 25 ft. wide, running east and west throughout the length of the building, with lateral passages branching off it. The shops, for the most part, front to these side passages, which, with the central avenue, are intended for foot-passengers only. Each shop consists of a front part, with stout open oak framing next the passages and adjoining shops. This portion of the shop is open above, and here the meat will be exposed during the hours of sale. At night the stock will be carried into the back part of the shop, which can be enclosed by open sliding shutters. The remaining sides are formed of oak framing, filled in with slate panelling. Stairs conduct to a room above, which may be occupied either as a counting-room or retiring-room for the principal. A room of this sort has been much desiderated by the various parties consulted as to the details of arrangements. On the same floor are provided water-closets and washhand-basins. Over this room is a platform roof, between which and the main roof of markets there is ample space for ventilation (over the whole area of the building).

These shops occupy a space 30 ft. by 15 ft. The front shop, back shop, and room over the latter are each about 15 ft. by 15 ft.

At the four corners of the market are the refreshment-rooms, which are on the first floor. The towers forming the angle of the building,—where not occupied by the accumulators required for working the hoists,—are appropriated as bars for frequenters of the market.

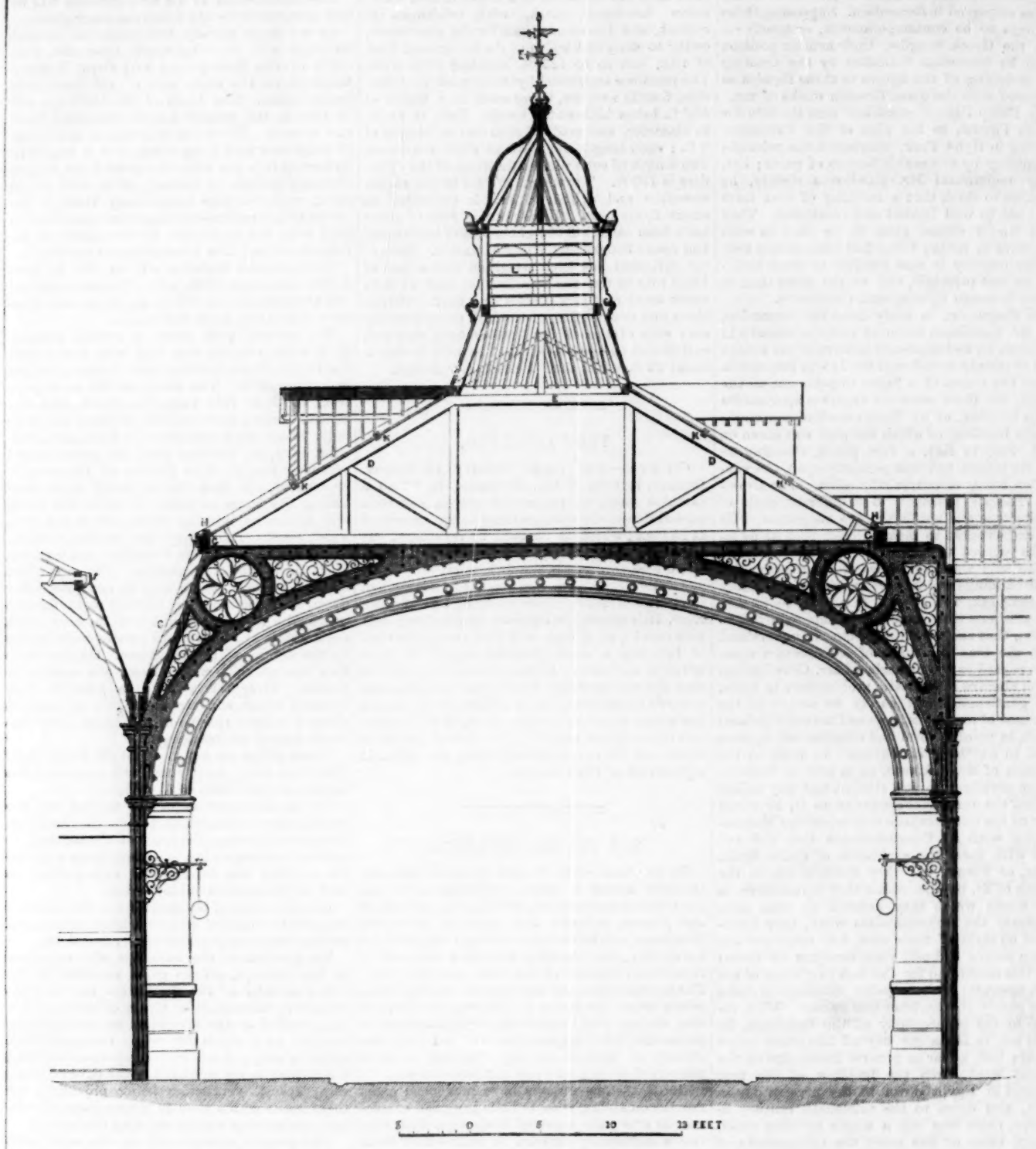
On either side of the gateways at the external ends of the central avenue, public urinals and water-closets are provided on the first floor.

The position of the buildings, with reference to the railways, affords great facilities for the direct transfer of the meat from the railway-wagons to the market by means of hoists, which are provided at various points as conveniently situated as possible for ready communication with the shops. A staircase communicating with the railway below is placed in the covered roadway; special ventilation being provided over these hoists with a view to prevent any effluvia from the railway-station entering the market.

The general arrangement of the architect's design has been necessarily accommodated to the somewhat peculiar circumstances. The whole area of the market and roadway being carried on a system of brick arching, wrought-iron girders and columns, rendered it impossible, or at least inadvisable, to construct any central feature, such as a tower or dome, which might have been desirable. This difficulty has been met by the importance given to the four towers hereafter described, the frontispiece of covered roadway, and the louvre which is placed at the intersection of the main roofs.

The style adopted is Italian, treated with some slight feeling of Renaissance or Cinque-cento. The enclosing walls present a series of arcaded recesses, with Doric pilasters, which are fluted in the upper two-thirds and raised on pedestals; the entablature being returned and ornamented over the pilasters, and finished with ornamental vases. The height of the main portion of the front elevation is 31 ft. 6 in. The heads of the arches between the pilasters are filled in with light open ironwork. In the recess of the arches are windows filled with ironwork of plainer design.

The principal feature in the longer fronts is the roadway, the frontispiece of which has an arch of cast iron, abutting on clustered pilasters, surmounted by large sitting statues. The elevations are terminated, as we have said, by towers at the angles, 90 ft. high, square on the lower half, with coupled pilasters at angles, and octagonal



THE METROPOLITAN MEAT AND POULTRY MARKETS.—*Section of Main Roadway.*

above, finished with domical roofs. The offset from the octagon to the square is managed by introducing griffins (the City supporters), holding shields charged with the arms of the City. The end elevations have the gateways leading to the central avenue as their principal feature. These gateways, the openings of which are 26 ft. 9 in. by 19 ft., are flanked by coupled pilasters, with an elliptical arch filled in with the arms of the City, and an enriched pediment over the openings. The cast-iron gates for these are 20 ft. high by 19 ft. wide, very elaborate. The twelve side entrances to passage which occur in the longer fronts, are completely filled with the same sort of ironwork.

Internally one of the principal architectural effects will be the roadway, of which we may hereafter give a view, with its wrought-iron curved principals, louvred roof for light, the oak framing of the side shops ornamented with light iron scroll-work, and the iron gates of avenue which occur in the centre.

The central avenue depends principally for its architectural appearance on the screen of oak framing filled in with cast-iron scroll-work, which is carried up to the spring of roof timbers, and the dressing of the curved principals, and promises to be effective.

The arrangements for lighting and ventilation are of so much importance in a work of this kind that it is satisfactory to hear that much attention has been bestowed on them.

The roofs of the market, which run east and west, and are in nine bays in the breadth, are an adaptation of the mansard roof, the lower portion filled in with glass louvres, contrived with the view of admitting light and air without the direct rays of the sun. There are also louvred dormers in the upper portion of roof.

The markets and roadway will be lighted with gas, with handsome pendant globe-light in the central avenue, and large scroll brackets in the roadway. Messrs. Browne & Robinson are the contractors for the works, at a sum of 134,460*l*. The whole building, it is expected, will be finished in fifteen or eighteen months.

REFERENCES.

A. Curved wrought-iron girders, 12 in. by 7 in. by ½ in.
B. Tie beams, 10 in. by 7 in.
C. Lower principal rafters, 12 in. by 7 in.; intermediates, 12 in. by 4 in.
D. Upper principal rafters, 11 in. by 7 in. to 10 in. by 7 in.; common rafters, 4 in. by 2 in.
E. Straining beam, 10 in. by 7 in.
F. Pitching plate, 5 in. by 4½ in.
G. Curb plate, 14 in. by 10 in. with wrought-iron flitch, at entrance to central avenue.
H. Pole plate, 5 in. by 5 in.
K. Purlins, 10 in. by 6 in. trussed with wrought-iron rods.
L. Glass louvres.

THE METROPOLITAN MEAT AND POULTRY MARKETS, SMITHFIELD.—MR. HORACE JONES, ARCHITECT.

THE LATE CALAMITOUS PIT EXPLOSIONS.

AN army of 500 hard-working and most useful fellow men have been slain, at almost one blow, by artillery of a far more tremendous description than any yet invented for warlike purposes, and it is doubtful whether so many Englishmen have been slain so nearly simultaneously in this country since the last civil war.

In many cases, defective ventilation has been the but too obvious cause of colliery explosions, but there is something remarkable about the late succession of pit accidents. First, of explosions, there have been a succession of these in different places within a few weeks. Only two days before the Barnsley accident an explosion took place at Bolton, when between fifty and sixty persons were seriousiy injured, many of them probably fatally. Then at Barnsley there have been no less than nine or ten explosions in all, the first and second of which committed such havoc amongst the pit men and their gallant would-be deliverers. The first explosion at Barnsley, had scarcely time to horrify the public when the Hanley explosion took place. Thus in Lancashire, in Yorkshire, and in Staffordshire, almost simultaneously, pit explosions have been taking place. Moreover, in South Durham, sinkings of the ground above coalpits have about the same time occurred, houses have fallen, and roads have sunk in, while a valley has appeared on the top of a hill, and in many fields great yawning chasms have been sunk in the ground, and whole fields have disappeared. Such changes have not occurred in one part of Durham alone, but in various parts, so that several roads, much land, and many houses have been destroyed; and although these changes have been traced through the colliery districts, they are now ascribed to a slight earthquake acting readily on a surface made unsound by coal workings beneath. And that slight earthquakes have repeatedly occurred in this country since the Londoners were lately startled by the new sensation, there seems to be little doubt. But we are not quite done with the list of casualties. We have instanced four counties, not merely adjoining ones, in which they have occurred, and to these we must add another, for an alarming subsidence of the ground has occurred at Newton, near Stourbridge, in Worcestershire, also above a colliery.

In the accident at Barnsley, the explosions were preceded by furious blasts of the explosive fire-damp as it escaped from its ancient prison walls into the workings. It then took fire and exploded. A blasting operation in the completion of a ventilating shaft, however, appears to have had something to do with the first explosion. In the case at Hanley the exciting cause of the explosion of the fire-damp has been discovered to have been the unprotected safety-lamp of a blacksmith at the bottom of the pit shaft. Of course, this does not account for the rush or escape and accummulation of the fire-damp itself at the time. Apart from earthquakes, which affect the state of the atmosphere, the fall of the barometer of late has been supposed to indicate an atmospheric cause capable of accounting for the simultaneous escape of fire-damp in mines.

We are glad to find that funds are rapidly flowing in for behoof of the surviving sufferers and the widows and families of the killed. The most complete safeguards should, surely, be insisted on in mines.

INSTITUTE OF ARCHITECTS OF IRELAND.

A MEETING of this body took place on the 20th inst., at the rooms, Great Brunswick-street, Mr. J. J. M'Curdy, fellow, in the chair. Amongst those present were Messrs. Landhem Lymes, F. V. Clarendon, J. H. Owen, J. Lanyon, W. N. Welland, W. Gillespie, E. Trevor, Owen C. D. Astley, F. Franklin, T. Drew, W. Fogarty, T. N. Deane, &c. Mr. Thomas Drew, to whom the "Fitzgerald medal" had been awarded for some drawings of St. Audeon's Church, Corn-market, read a report, giving a description of the drawings and history of the church. He remarked on the exceptional position which the church of St. Audeon occupied amongst the churches in Dublin. Of a large number of abbey churches there were no remains, and of the parish churches left, St. Bride's and St. Werburg's retained some of the masonry of the ancient churches only; the cathedrals of St. Patrick and Christ Church retained some beautiful examples of early Gothic architecture, but only one parish church, that of St. Audeon, presented it in such a condition as to tell of its departed glories. The plan of the church was an exceptional type of Mediæval architecture. It was double aisled, of eight bays in length, with no distinctive chancel, and the aisle being nearly in width with that of the nave. St. Audeon who had been chancellor to Dagobert, finally became Bishop of Rouen, in which city the lecturer believed there still existed some relics of him. When he visited the church of St. Audeon, at Rouen, he failed, however, to discover that its patron saint had ever been in any way connected with his old acquaintance in Corn-market, Dublin.

THE POULTRY MARKET.

A SMALL pamphlet has been issued by Mr. G. K. Geyelin, C.E., of Belgrave House, Argyle-square, author of a work on poultry breeding, in which he proposes for the improvement of the anomalous and unsatisfactory English system of selling poultry, to form an association of poultry breeders, with the following among other objects:—1. To establish the Dutch or drawback auction system in selling wholesale the produce of poultry farms. 2. To receive consignments of live and dead stock, in large or small lots, for daily sales, and of choice breeding stock for a weekly sale; the produce of sale, less the usual commission, to be remitted the same day to the consigner. 3. To promote the sale of dead poultry by weight. 4. To become a medium of intercommunication between poultry breeders in this and foreign countries, and to promote poultry breeding generally. The association, he adds, could also contract with hotels and public institutions for the supply of poultry, eggs, &c. Premises centrally situated for a wholesale poultry market could, he remarks, be found in London; therefore it depends on the breeders and the public themselves whether they continue to submit to the present unfair system of selling.

SCHOOLS OF ART.

The Lincoln School.—The annual exhibition of the productions of the students of this school attracted a large number of visitors. The walls of the school-room were crowded with the works of the past year, and the more delicate studies in outline were placed on tables down the centre of the room. The improvement upon the last exhibition, according to the *Lincolnshire Chronicle*, was strongly marked—more especially in the advanced stages of painting from nature. The distribution of prizes took place in the school on the second day of the exhibition before a large company. The Mayor presided. The Rev. J. S. Gibney read the report of the committee, which congratulated the meeting on the continued satisfactory state of the school. Mr. Taylor, the master, then read his report, which says,—"The working of the school during the past year is the most satisfactory of any since its opening. The number of students in attendance is higher, the number who have executed a good year's work is much greater, and the number of prizes and distinctions awarded by the Department of Science and Art is also greater. The students for the year are,—Special class, 19; general, 30; school, 23; evening class, 104; pupil teachers, 34; total, 210. A change has been made by the Department of Science and Art in the method of awarding prizes. The advanced stage of painting and design can no longer compete for the local medal or prize as hitherto, but can only enter into national competition, the selection for which competition is made in London from the works sent up from each school; and, after the awards are made, they are exhibited at South Kensington, and in one of the larger towns of the kingdom. The results obtained by Lincoln are,—18 works were selected for national competition, one of which obtained a national prize; 27 third-grade or medal prizes; 19 second-grade prizes for time drawing; 43 certificates for the same; and 7 honourable mentions. Comparing these results with other schools we find that about 60 schools out of the whole number of 100 have been unsuccessful in the national competition. In the third grade or medal prizes only three schools are higher than Lincoln, viz., Glasgow, Edinburgh, and West London. The average awarded to each school is less than 7: Lincoln has 27. In the second grade 10 schools are higher than Lincoln, viz., four of the London schools, the two Liverpool schools, Bristol, Dublin, Exeter, and Newcastle-on-Tyne. The average of students successful in this grade for each school is about 24: Lincoln, 51. Three schools send up more sets of satisfactory works than Lincoln, viz., Birmingham, with 1,009 students, sends up 293 sets; Glasgow, with 771, sends up 149 sets; West London, with 528, sends up 142 sets; Lincoln, with 210, sends up 110 sets; so that even here, in proportion to the number of students, Lincoln is by far the highest. And the average for each school is 33: Lincoln 110."

The Carlisle School.—The annual meeting of subscribers to this school has been held in the school-room, Finkle-street. The mayor presided, and Mr. Potter, M.P., distributed the prizes. The hon. secretary read the report, which stated that during the past year the number of students was quite as large as that of previous years, and they believe that the school is steadily gaining ground, and hope extending its influence and usefulness to all classes of the community. The number of students at present on the books, continues the report, is especially encouraging, and your committee have every confidence, from the attention and abilities of the master, Mr. Lees, that this number will be maintained. The result of the examination of the works of the students has been very satisfactory, although the number of prizes and certificates awarded has not equalled that of some of the previous years. This may be accounsed for by the new minutes issued by the Science and Art Department, in which they determined to lessen the number of prizes by raising the standard to be attained by the successful drawings. Fifteen works have been sent to London during the past year for examination, of which five obtained prizes, nine passed as satisfactory, and on which results have been paid; of these, from their excellence, seven were selected for national competition, one of which obtained a bronze medal, the highest award given by the Department for this class of work, and of which there were only fifty-one awarded throughout the United Kingdom. At the annual examination of the students themselves, seventy-five passed in the second grade; of these nine obtained prizes or certificates in freehand, two in perspective, and four in model drawing. The fees paid by the students, which are partially regulated by the Department, are so low, according to the report, as altogether to preclude the possibility of the school ever being self-supporting.

Proposed Banbury School.—A preliminary meeting for the purpose of considering the propriety of establishing a School of Art for Banbury has been held in the Council Chamber, Town Hall. It appeared that about 130*l.* a year would be sufficient to begin the school, including 100*l.* salary of master, 16*l.* rent of premises, and the expense of models. The Government Department of Art would send down a Certificated Master, if 100*l.* a year salary could be guaranteed. If the promoters could get a class of fifty artisans, and another of young ladies at a higher figure, the school might be made self-supporting. It was unanimously resolved "that it is the opinion of this meeting that it is desirable to establish in this town a School of Art, in connexion with the Department of Science and Art;" and a committee to carry out the object of the meeting was appointed. A list is to be made of persons willing to guarantee 100*l.*, the master's salary, and subscriptions will be received towards the expense of examples and fittings.

A School for Maidstone.—A committee has been formed in Maidstone for the purpose of establishing a School of Art in connexion with the Government School at South Kensington. An efficient instructor, who holds certificates from the Department of Science and Art at South Kensington has been engaged, and the project has already been warmly taken up. That a certain number of students may enrol themselves before a commencement is made, names are being sent in to the hon. secretary, the Rev. H. Collis, St. Philip's Parsonage, with whom the project originated.

The Penzance School.—The presentation of prizes to the pupils who were successful at the annual examination in March last has just been made by the mayor. The great success of

several of the pupils, and the position they have obtained in Schools of Art at Macclesfield, Halifax, and elsewhere; the perseverance of the master, Mr. Geoffroi; the recent redecoration of the room; and apparently an increasing interest in art, have tended, according to the local *Telegraph*, to popularise the school; and it was crammed on this occasion with persons anxious to see the students receive their rewards. A resolution was unanimously passed pledging those present to increased exertions for the cause of art generally, and this school particularly.

DWELLINGS FOR THE POOR: STATISTICS.

Sir,—After the discussion which has now taken place upon the argument which I recently laid before the Institute of Architects, I think I may say that the most important question at issue stands as follows:—I point out that, amongst the poorer classes of working people, single-room lodgings are at present the rule; and this is admitted to be a fact. I then further allege that this fact is not altogether due to their poverty, but in a great measure to the circumstance that a large proportion of them are actually so situated, as regards the small number of persons per family, that single-room lodgings are sufficient: and this is disputed. I thereupon appeal to statistics.

At the Institute I took the returns of a certain inquiry in St. George's, Hanover-square, in 1842. The dwellings of about 1,500 families of the poor were visited; and amongst these the single-room lodgings proved to be 63½ per cent., the two-room lodgings, 28 per cent., and the three-room lodgings, 8½ per cent. It was also found that the possessors of only one bed were 43 per cent.; of two beds, 44 per cent.; and of three beds and more, 13 per cent. On these data I endeavoured to construct a table which, by means of subdivided classification, should bring about an approximate estimate of the per centages actually requiring one, two, and three rooms respectively, according to the numbers in family. I commenced proceedings by patiently trying the effect of several kinds of allowances, which I thought, at first sight, ought to be made in one direction and another, by way of corrections of these returns, under a vague impression that, as they stood (representing, I imagined, a *deficiency* of rooms and deficiency of beds), they could scarcely be a perfect criterion for my purpose (which involved the idea of *sufficiency*, although at a minimum, in both); but I found these corrections at the best had very little influence upon ultimate results; as any one may prove for himself by experiments upon my tabulation. I then reflected more carefully upon the returns as they stood, and upon the particular character of the locality from which they were obtained; and I could not help thinking that, after all, as matter of fact, the reasons for making allowances in one direction, and those for doing the same in precisely the contrary direction, were very much of equal weight; and that, in a word, the sort of people who would be likely to be the subject of such an inquiry in such a place as the parish of St. George's, Hanover-square, were by no means likely to be other than a reasonably fair sample of the badly-lodged poor,—the class between the well-to-do artisans above and the pauperized and depraved below. I therefore decided to accept the returns as I found them.

In constructing the following table, let it be first observed that I had to work to the exact totals of the 63½, 28, and 8½ per cent. in one direction (horizontally) as regards number of rooms, and the 43, 44, and 13 per cent. in the other direction (vertically) as regards number of beds. Accordingly I divided the 63½ per cent. of single rooms into 35 supposed to be occupied by families requiring but one bed (people without children, old people, and single women); 15 by such as required a bed for very young children in addition; 10½ by families requiring two beds for adults (or adolescents); and three by those requiring still a children's bed besides these two. In like manner I divided the 28 per cent. of two-room lodgings into 8 for one bed, 10 for one bed with one other for children, 6½ for two beds, 2 for two, and another for children, and 1½ for three beds. Lastly, the 8½ per cent. of three-room lodgings I appropriated at the rate of 2 for two beds, 2 for two and a children's bed, and 4½ for three beds. This appropriation had, of course, been governed all the while by the necessity that the cases of one bed should add up to 43, those of two beds (children's beds included) to 44, and those of three beds (children included) to 13. My table then stood as follows:—

	One Bed. 43	One Bed and Children } Two Beds. 44		Two Beds and Children } Three Beds. 13		Totals per cent.
One Room.....	35	15	10½	3	0	63½
Two Rooms	8	10	6½	2	1½	28
Three Rooms ...	0	0	2	2	4½	8½
	58 requiring one Bedroom.	34 requiring two Bedrooms.		8 requiring three bedrooms.		

The result is, no doubt, surprising enough; namely, that 58 per cent. of the poor (35 + 15 + 8) can be decently lodged in single rooms, by reason of the small number in family; that 34 per cent. more require only two rooms; and that only 8 per cent. need three rooms: and I must be allowed to say that if this be actually true, the difficulty of providing dwellings for the poor, at the lowest possible rent, becomes a much smaller difficulty than we have been accustomed to suppose; and further, that such a simplification of a great problem ought to be welcomed if really founded on fact.

This calculation, however, cannot be given dictatorially; it can only be offered for investigation: and indeed, so unexpected must be these results to many persons, that I am most anxious to encourage all inquirers to make experiments by appropriations of their own; although I certainly must confess so much confidence in my own reckoning as to think it will be found that no results can possibly be brought out very wide of what I have given.

Evidence in support of the reasonableness of the above calculation happens to be furnished accidentally by the statistics obtained (as stated in the *Builder's* review of my lecture) from the parishes of St. Margaret and St. John, Westminster. The number of beds in these statistics are about 1½ per family; in the St. George's statistics they are about 1¾ per family; and this comparison, I think, corresponds exactly with the view I have taken of the St. George's poor as a fair sample of the lowest respectable class; the St. Margaret's and St. John's poor being undoubtedly of a somewhat inferior order, comprehending a considerable proportion of the pauperized and depraved.

I have recently, however, tested my results by a process based on altogether different data. The census of the United Kingdom gives us, as respects the ages of the population, the following facts:—Under ten years of age, 27 per cent.; between ten and twenty years, 21 per cent.; between twenty and fifty years, 37 per cent.; over fifty years, 15 per cent.

Let me designate these four divisions respectively by the terms,—1st, *Childhood*; 2nd, *Youth* (unmarried); 3rd, *Prime of Life* (possessing children, chiefly in childhood, some in youth); and, 4th, *Age* (possessing children, chiefly in youth). I propose to sub-classify these divisions, and to appropriate in detail the two divisions of childhood and youth to the parentage of the other two divisions, whereby to arrive at a classification of *homes*, as regards requisite scale of (minimum) accommodation. I have to premise that some of the youth under twenty will obviously have left the parental homes (as single-men lodgers, &c., and women servants); that some of those above twenty will be in the same case; that lodging-houses ought not to be included in the reckoning; that single men have not to be considered at all, but that single women have; in short, that it is the home-keepers alone that we have to deal with. Let me, then, at once set forth the following table:—

		Ages.				Homes.		
		Age.	Prime.	Youth.	Childhood.	One Room.	Two Rooms.	Three Rooms.
Childhood (27 per cent.)	.....	—	—	—	27	—	—	—
Youth (21 per cent.)	Left home	—	—	4	—	—	—	—
	With parents widowed	—	—	4	—	—	—	—
	With parents married	—	—	13	—	—	—	—
Prime of life (37 per cent.)	Married couples and families...	—	17	8	13	4	3	1½
	Ditto without children	—	5	—	—	2½	—	—
	Widowed and families.....	—	5	2	4	3	2	—
	Single women alone	—	2	—	—	2	—	—
	Ditto in pairs	—	3	—	—	1½	—	—
	Left home	—	5	—	—	—	—	—
Age (15 per cent.)	Married couples and families...	3	—	5	5	½	½	½
	Ditto without children	5	—	—	—	2½	—	—
	Widowed and families.....	3	—	2	5	2	1	—
	Single women alone.....	2	—	—	—	2	—	—
	Ditto in pairs.....	2	—	—	—	1	—	—
	Totals.....	15	37	17	27	21	6½	2
	Equal to, per cent.					71	22	7

As a little explanation of this table may be necessary, let me point out that the 37 per cent. of people from 20 to 50 years of age I divide into 17 in married couples with families, and 5 the same without families, 5 widowed with families, 2 single women alone and 3 in pairs, and 5 as having left home as servants and lodgers and thus gone out of the account; that the 15 per cent. over 50 years of age I divide into 3, 5, 3, 2, and 2, in like manner; that the 27 per cent. of children under 10 I appropriate as 13 and 4 to parents in the prime of life, and 5 and 5 to those in age; and that of the 21 per cent. of youth between 10 and 20 I consider 4 to have left home (and thus gone out of the account), 8 and 2 to belong to the younger class of parents, and 5 and 2 to the older class. I then assign to each subdivision of home-keepers such proportions of one, two, and three room lodgings as seem reasonable; for example, taking the principal class, that of married couples in the prime of life, with families, there being 17 persons (8½ couples) with 13 children young and 8 growing up, I assign to 4 of these couples one room, to 3 two rooms, and to 1½ three rooms; and so on with the other classes. The figures finally resulting as totals of homes in the form of 21, 6½, and 2, are, of course, equivalent respectively to 71, 22, and 7 per cent.; so that, large as the 58 per cent. appeared for single rooms, when resulting from the St. George's statistics, I fear it must be said that we should have some difficulty in keeping to so low a figure in this fresh calculation.

I therefore cannot do otherwise than again urge upon those who are interested in the important problem of providing better homes for the humble, either to dispute or to admit my proposition, that a large half of the poor do not require as matter of fact anything more expensive or more complex than single rooms; and I submit that if this cannot be disputed, we are led into a new and easy way of solving a large part of the problem, namely, the devising of plans whereby to build new dwellings and alter old ones, so as to give to the poor, in the utmost possible refinement of the single-room system, something that shall be as simple as their other necessities, and as cheap as their other purchases.

Robert Kerr.

SAVE CROSBY HALL.

I HAVE just read the excellent article on "Old London," and amongst the many buildings in the City you mention "Crosby Hall." I think, as it is now advertised for sale, the Corporation ought to buy it, and open it as a Free City Library, Young Men's Institute, or anything by which it will be preserved; it might then be restored, and we should thus retain an excellent specimen of ancient architecture. Too many old buildings are now being destroyed, and I think it is quite time something should be done to preserve them.

AN ARCHITECT.

LIGHTING DARK APARTMENTS.

SIR DAVID BREWSTER writes as follows: — I beg to thank you for your notice of my address to the Royal Society of Edinburgh, on the lighting of dark apartments, and your correspondent, Mr. Garbett, for his kind appreciation of the method I proposed. His suggestion for diminishing the quantity of ground glass, though ingenious, will not, I think, be applicable in practice.

1. It would obstruct the view from other windows.

2. It would prevent light from falling freely on windows below it.

3. When covered with snow, it would obstruct the light altogether.

4. When wet with rain, the glass would cease to throw light into the apartment.

5. When covered with dust, it would be equally ineffective.

6. It would not receive, and use, as the vertical window does, the light from the walls and other objects before, above, and below it.

7. It does not furnish, as the vertical window flush with the wall does, any additional space to the apartment.

Allerly, Melrose.

A PROPER BUILDING FOR ARCHITECTS.

SIR,—You say truly, "The green enthusiasm of our correspondent is delightful." Yes, it is delightful as the spring time, when all nature is gay in her brightest livery of green—when the birds sing most joyously and the sun shines most brightly; it is then the seed is sown which is to be gathered in autumn. Ay, there it is; in the green spring we sow, in the sear and yellow autumn we reap; the chill winds and damp fogs of winter will soon strip off the green garment, and white frost and snow will take its place.

"Keep true to the dream of thy youth," says the sage; and who takes his advice but a few green ones. What folly to suppose that a body of architects would build for themselves a notable specimen of their art; far better let such things be done by other associations who will pay for them. Why, an architectural museum should be a specimen of *what to avoid;* so that members of the profession might be enabled to say, "This is the sort of thing you should *not* do." "The cobbler's wife is always slipshod," and the jeweller should never wear trinkets. Don't you see, verdant youth, that it is to avoid being "shoppy" that the Architects' House is a "stucco lump," a specimen of the modesty and good sense of the profession. It is only a green enthusiast like Pugin (and he was not a *regular* member of the profession) who would think of building for himself a house in the way he would have others do. How many architects have built for themselves a specimen of good architecture? A few painters and sculptors have done so; but then, you see, they adorned their halls with the works of their compeers, and not with their own; and what architect would be so foolish as to employ another to design for him what he himself could do so much better.

SCRIPSIT.

BUILDERS' CLERKS' GRIEVANCES.

SIR,—With regard to your correspondent "R. F. C.," on the subject of reference, much could be said; and I must to a great extent, and fearlessly so, give my adhesion to the sentiments there expressed as to the great want of generous feeling exercised by some employers in matters of such vital importance.

A builder's clerk's health and reference are his capital. The former is too often injured by constant unreasonable and unseasonable hours of sedentary duties, and this in cases without remuneration.

Confinement of so close a nature too often leads to excesses when relaxation takes place; punctual attendance, energetic, precise, and correct habits, in time give way to slothfulness and don't-care principles. Home he knows little of; with exhausted energies he seeks a rest of slight repose. If health give way, dependence on his employer follows; and it is this dependence that retards the upward progress of many an educated worthy man. An advance of 2s. or 3s. per week offered by another employer ofttimes is sufficient inducement for a clerk to resign one interest for the other. Under any circumstances removal does not engender (as a rule) good feeling, and much can be implied when giving a reference that may not be actually stated. Absence from business, inattention, and carelessness, without assigning ill-health or overwork as perhaps being the primary cause, are sufficient to annul an engagement.

Clerks are ofttimes the cause of the grievances they complain of, and to obtain position will offer their services at inadequate salaries,—to obtain favour will, as a custom, exceed the stipulated hours of duty. Until, as a body, we really feel in heart that we can conscientiously render our best services and obtain respect from our employers, more by respecting and not by fearing them, there always will be grievances, sorrow, and destitution amongst the builders' clerks.

PETO.

LABOUR AND TAXES.

SIR,—Before the working classes are actively blamed as the cause of driving capital out of the country, let us investigate the increase of the taxation, rates, and rents, and through that the increase in price to the consumer of food, clothing, &c. And do you consider the food of the foreign workman equal in cost or quality to the English working man's? Again, I learn, to increase their wages many foreign working men work on Sunday—so wrote an engineer to the *Manchester Weekly Times* some few months ago. In this matter of trade let everything bearing thereon be thoroughly investigated, and then I have not the least doubt, whatever may be inconsistent in much of the Trade Union rules, this of driving the trade away from England is not one of the inconsistencies or errors. Let the increase in wages be compared or contrasted with the increase of all these items named by me, and then see how much the working classes are in pocket by the increase of their wages. It strikes me as too true a fact in our industrial progress, that the *more we labour the more we may.*

T. D.

BUILDERS' ACTIONS.

Hardman v. *Chadwick.*—*Chadwick* v. *Hardman.*—These actions (Northern Circuit, Manchester, December 6) arose out of a dispute between Mr. Hardman, a contractor, and Messrs. Chadwick, the owners of large paper-mills at Broughton, near Manchester, owing to the fall of a chimney 70 yards high, which Mr. Hardman had agreed to build for Messrs. Chadwick on ground excavated by them. The main question in the cases was whether the chimney fell through the negligence of the contractor or through the fault of Messrs. Chadwick in having it built in an improper place and on insecure foundations, the place chosen being near some reservoirs and a well 200 yards deep, and the soil being sandy and quick. An architect was appointed by Mr. Chadwick to superintend the building of the chimney, and he from time to time gave Hardman certificates of his work being properly done. During the building of the chimney, however, some water was pumped out of the neighbouring well, and when the chimney was within a few feet of completion it began to lean over on the side next the well, and it was discovered that the slabs of stone on which it was built had sunk between 2 in. and 3 in. Before long it fell altogether, and Messrs. Chadwick refused to pay Hardman the full price of his contract, alleging that the chimney had fallen in consequence of the bad building.

The second action was brought by Messrs. Chadwick against Hardman for not building the chimney in a workmanlike manner, according to his contract.

The jury returned a verdict for Mr. Hardman in both actions.

CASES UNDER THE METROPOLITAN BUILDING ACT.

Pipes for Hot Water.—At the Greenwich Police Court Mr. Z. D. Berry, of the Albion Works, Pimlico, attended to a summons, at the instance of Mr. Badger, jun., deputy district surveyor, charged with an infringement of the Metropolitan Building Act.

Mr. Badger stated the complaint was that pipes had been put in a new church at Sydenham for the purpose of heating the building by means of hot water, and that such pipes were placed within 2 in. of the woodwork, the 21st section of the Act, rule 4, declaring it unlawful to place pipes for the purpose named within 3 in. of any woodwork or other combustible material.

Mr. Traill said no doubt the object of the Act was to guard against fire; but to suppose that woodwork would take fire from the heat of the hot-water pipes was preposterous. The effect of such heat upon the wood would be to dry it up and make it less lasting; but that there was danger from fire was absurd. He did not believe even gunpowder would become ignited by such means.

Mr. Berry said he had been engaged at the offices of the Metropolitan Board of Works, Spring-gardens, carrying out a similar system of heating, under the superintendence of the Board's surveyor, Mr. Vulliamy, and there the pipes were actually on the woodwork. The most delicate substance could not take fire from the heated water-pipes, not even a lucifer match; and if the section of the Act referred to was strictly enforced, it would be simply impossible to have the luxury of heated pipes in a gentleman's bath-room.

Mr. Badger said his only desire in bringing the case before the magistrate was to shield himself from responsibility.

Mr. Traill said the surveyor had done no more than the Act required him to do in the performance of his duty; but under the circumstances that the Metropolitan Board of Works, by their own architect, had allowed pipes to be laid in their own offices at a distance of not even 2 in. from woodwork, he thought the present summons might be dismissed on payment of 2s., cost of summons.

*** Gradually each distinct enactment of the Act is being set aside, so that builders do not know what will be required, and district surveyors what they can enforce. Mr. Traill appears to have forgotten that buildings *have* been set on fire by hot water under pressure. We have ourselves lighted a common brimstone match on pipes full of water from a close boiler.

Wooden Buildings.—David Shimmins was summoned to Clerkenwell Police Court at suit of the district surveyor of South Islington for erecting a building in forecourt of of South Islington for erecting a building in forecourt of 3 in. Before long it fell altogether, and Messrs. Chadwick a house in Ball's Pond-road without giving notice; also for inclosing the said building with timber and woodwork, contrary to preliminary rule 1, 1st schedule. Fined 3s. (district surveyor advising that fine should be small), and ordered to pay 7s. costs in first case, and to amend the irregularity in second. Refusing to pay the fine, the magistrate committed him. It was, however, ultimately paid.

METROPOLITAN BOARD OF WORKS.

AT the last weekly meeting of the Board the report from the committee of the whole Board on the supply of gas to the metropolis was considered. The report recommended, amongst other things, that the price should be 3s. 6d. per 1,000 ft., and should be of a definite illuminating power and purity. Mr. Collinson moved as an amendment to the adoption of the report, "That this Board are of opinion that the maximum price of gas should be fixed at 3s. per 1,000 cubic feet." In doing so he compared the supply of gas at Manchester and other places with that of London, much to the disadvantage of the latter city. The amendment having been put, was lost by a majority of 3. Mr. Brushfield then moved as an amendment, "That the subject be referred back to the committee, in order that they might arrive at a more thorough understanding of the matter." This amendment not being seconded, the original motion was carried.

Mr. Collinson moved, "That in consequence of the great delay which has taken place in the making the purchase and necessary arrangements for providing the Finsbury and Southwark parks for the use and recreation of the public, a special committee of fifteen members be appointed for the purpose of carrying out the directions of the Board in laying out and enclosing the said parks, in order that they be prepared ready for the use of the public in the spring of next year." The motion was lost by a majority of 15 to 12.

In answer to Mr. Doulton, the chairman said an injunction had been applied for to the Master of the Rolls to restrain certain parties from building on Hampstead-heath, and he thought that it would not be well for the Board to take the question into consideration pending that inquiry. Mr. Silas Taylor then moved, "That the chairman be requested to seek an interview with Sir Thomas M. Wilson, and ascertain whether he is prepared to negotiate for a sale of his interests in Hampstead-heath and adjoining lands to the public use, and if so, upon what terms; and that the result of such interview be communicated to the Works and General Purposes Committee for their consideration, and report to the Board." After considerable discussion, the motion was agreed to with slight alterations.

THE MASTER BUILDERS OF EDINBURGH AND THE PAROCHIAL BOARD.

A SPECIAL meeting of the City Parochial Board was recently held in the Council Chamber for the purpose of considering a communication received from the Association of Employers in the Building Trades of Edinburgh, in reference to the specifications which had been issued for the proposed contract for building the new poorhouse at Craiglockhart. There was a large attendance of members.

Along with the letter, the inspector had received a report of a Committee of the Builders' Association, with an intimation that a deputation would wait upon the Board to give them any information which they might require.

Some discussion took place as to whether the Board ought to read the report of the committee and receive the deputation, or come at once to a resolution upon the letter which had been received, without hearing the deputation or reading the report of the committee. In the course of this discussion,

Mr. Stott said the two leading architects in the town had called upon him, and stated that the Board would do quite wrong if they altered the conditions of their contract. One of these gentlemen told him that there was nothing like cohesion among the members of the Association of Employers in the Building Trades, and that the resolution at which they had arrived would not bind three of them. He had no doubt that they would get parties to tender. He complained that the builders had not come forward sooner to object to these general clauses in the contract, as the subject had been long under consideration in the Board. Mr. Stott was of opinion that they should, without hearing the deputation, at once resolve to adhere to the conditions of the specification; and he moved accordingly.

Mr. David Lewis maintained that the association of employers were unwarranted in the step which they had taken, as that association had been formed for the very purpose of protesting against and protecting employers from combination on the part of the workmen; and the employers with strange inconsistency, were now turning their association into a combination, and making a virtual strike to concuss the Board.

The Chairman, and other members who took part in the discussion, were of opinion that, before coming to any decision, the Board ought to read the report of the committee, and receive the deputation. This having been agreed to, the report was read, and the deputation, which consisted of three or four members of the building trades, headed by Mr. Forbes, and accompanied by Mr. Nisbet, the law agent of the association, were introduced.

Mr. Forbes, on the part of the deputation, stated that what they complained of was, that the specifications were so vague and uncertain

as not to give security in estimating. In reply to questions, Mr. Forbes stated that there were present thirty or forty members of the building trade in Edinburgh when the report was adopted, and that, unless a strike clause were inserted in the specification, they would not estimate, because the feeling on the part of the workmen was such that it would not be safe for them to tender for the work without a clause protecting them in the event of a strike. They had for the last five years been contending for the removal of the objectionable general conditions in specifications, and the same effort was to be made throughout Scotland and England.

After the deputation withdrew, the following motion was unanimously adopted :—

"That the Board, having considered the communication from the Building Trades' Association, and heard the deputation, and seeing that schedules have been applied for by first-class tradesmen in various parts of the country, resolve to decline to entertain any proposals to alter those plans and specifications for the new Poorhouse as adjusted at the last meeting of the Board, seeing that these specifications contain the usual terms in building contracts."

It was reported that at the meeting of the Board it was agreed to ask Messrs. W. Beattie & Sons to tender for the works. The two senior partners of that firm are brothers of Mr. George Beattie, the senior of the firm of Messrs. G. Beattie & Son, architects to the parochial Board.

Another meeting of the Board was afterwards held, however, at which the following resolution was adopted :—

"That the tenders lodged be not opened or disposed of till the finance committee report that it had succeeded in raising the necessary funds, and that the same shall be at the disposal of the board on or before a given date; and recommits the consideration of the terms of the specification to the law committee, to reconsider the same, and report such alterations thereon as will secure a sufficient competition for the work."

There were several tenders given in, but only two from Edinburgh, offering for the whole works.

The law committee, after seeing a deputation of the Association, agreed to recommend the following concessions to the Board :—

"1. That the Board should guarantee the quantities and the measurements.

2. That specimen walls should be built in connexion with the rubble work.

3. That David Bryce, Esq., R.S.A., whom failing, John Lessells, Esq., architect, be appointed arbiters, whom both failing, an arbiter to be appointed by the Sheriff of Mid-Lothian.

4. That an allowance of time should be made for bad weather, and for strikes on the part of the workmen.

5. That the sum to be retained should be 10 per cent., but that personal security would be required, and no interest allowed on the amount retained.

6. That the clause giving power to the architect to discharge workmen, should be struck out.

7. That quarrying should be restricted to three fields.

8. That the Board should insure the works.

9. That the Board should make roads before the work commences, as indicated by the architect: and,

10. That the Board should provide an office for the clerk of works."

The Association agreed to accept these alterations, and the Board adopted them.

GIFT PULPIT IN LINCOLN MINSTER.

At the cost of 600*l*., the friends of the Rev. Edward Trollope (who has given much time to the Lincoln Diocesan Architectural Society) have obtained and presented a pulpit to the Dean and Chapter of Lincoln. It was designed by Mr. Scott, and executed by Messrs. Thompson & Ruddell, of Peterborough; the carving being by Mr. Jay. The following description of the pulpit has reached us :—

In plan it is sexagonal. On a moulded base of Caen stone stands a massive circular pillar, whose shaft is composed of veined dark grey marble, round which are ranged six other smaller pillars, with red marble shafts, whose moulded bases, capitals, and abaci are of Caen stone, and these support an entablature of the same material, consisting of six moulded and cusped arches, terminating in carved pendants on each face. The remainder of the pulpit is composed of carved oak. On the lower band is a dedicatory inscription. At the angles of this band are brackets, on which are severally carved the foliage of the ivy, rose, maple, vine, thorn, and oak. Upon these stand statuettes, the special gifts of Chancellor Massingberd, Alfred Tennyson (the poet laureate), Professor Conington, J. L. Fytche, Anthony Trollope (the author), and the Rev. Wm. Smyth. The first of these (on the western side) represents John the Baptist; the second is that of St. Matthew; the third, St. Mark; the fourth, St. Luke; the fifth, St. John; and the sixth, St. Paul. Above each of these statuettes rises a carved canopy, and between them are four panels, whose frames are enriched with the ball-flower ornament. Within them are alti-relievi subjects, illustrating the holy office of preaching the word of God. The pulpit is finished with a cornice enriched with a wreath composed of the stem, leaves, tendrils, and fruit of the vine, indicative of the hoped-for fruitfulness of Christian exhortation. An oak staircase, appropriately carved, gives access to the pulpit: on either side is an iron hand-rail, consisting of four standards, from the top of which flow foliated branches, coloured; these support brass rails, terminating above in enamelled pomels, the work of Messrs. Skidmore, of Birmingham. Above the pulpit is a carved oak canopy, of a spirelike character, enriched with niches, statuettes, pinnacles, and carvings, the finial of which is 35 ft. above the pavement level. Slender shafts, similar to those of the adjacent stalls, alone connect the canopy with the pulpit below; but it is at present uncertain if these will be allowed to remain. Underneath, but above the future occupants of the pulpit, a series of moulded ribs spring from the six pendants at its edge, and are again gathered up in the centre around a boss, on which is carved a stag couchant and an oak branch, together with a small suspended shield, bearing "vert within a bbrder argent, three bucks trippant," impaling "sable, a chevron or between three crescents argent," for Trollope and Palmer. Without, the lower part of the canopy consists of six cusped and crocketed gablets, which are further enriched by foliated finials and pinnacles. Between each of these gablets niches rise from pendants below, and surmounted by highly-enriched canopies terminating in pinnacles. The niches are filled with small statuettes of apostles. From this lower portion of the pulpit canopy rise four richly-carved canopies, with slender pinnacles between them, forming a cluster, from the midst of which rises a dominant pinnacle, constituting a third and culminating stage. This pinnacle, square in plan, is supported by slender angle pillars, and surmounted by crocketed pediments, between which are little angle pinnacles; from the midst of these rises a spirelet enriched with crockets, and terminating in a foliated finial. Beneath the canopies of the intermediate stage are four statuettes of SS. Peter, James, Andrew, and Jude; two of which are special gifts, that of St. Peter having been presented by the Lincoln Diocesan Architectural Society, and that of St. Andrew by the Yorkshire Architectural Society.

THE HOMELESS BOYS OF LONDON.

On the 14th of February last, an invitation was given to the boys accustomed to sleep in the casual wards of London, and other nightly haunts, to come to supper at the Refuge, and nearly 200 accepted the invitation. During the evening Lord Shaftesbury, who presided, having questioned the boys as to their mode of life, asked them if they would be willing to go on board a ship if such were provided for them, and the hands of nearly all the poor and destitute guests were held up as an answer to the inquiry. The result is, that her Majesty's ship *Chichester* has been granted as a training school, and was opened last week by Lord Shaftesbury and a number of sympathisers. The chairman remarked, in the course of his address, that it had been said that the children of the poor should have recourse to industrial and certified schools. Where were the industrial and certified schools? After all the inquiries they were able to make, they were not able to find more than two for the population of 3,000,000 souls in the metropolis; 400 boys could be received on board the *Chichester*, and 200 could be sent away every year to recruit the number of our active seamen. The ship will lie at Greenhithe.

COMMUNICATION BETWEEN PASSENGERS AND RAILWAY GUARDS.

THE INSTITUTION OF CIVIL ENGINEERS.

On December 11, Mr. C. Hutton Gregory, vice-president, in the chair, the paper read was "On the Best Means of Communicating between the Passengers, Guards, and Drivers of Trains in Motion," by Mr. W. H. Preece. The author believed the almost unanimous conclusion, both in England and France, was, that if the problem was to be solved at all it must be by the aid of electricity. There was no force so ductile, so simply generated, and so easily manipulated.

The history of the trial of electrical appliances, from their first proposal in 1842 to the present time, was briefly narrated, and a description was given of the system, applied by the author, on the Midland, the Great Northern, and the London and South-Western Railways. The essential principle of this system was the extension of a single insulated wire throughout the whole train, which was maintained in a state of electrical equilibrium by having the similar poles of every battery in each van and engine attached to it, while their opposite poles were connected with the earth; so that when this equilibrium was disturbed, by placing the wire to earth through the framework, wheels, and rails in any carriage or van, the current from each battery acted upon the bell in its own van, and upon a signal on the engine. Its peculiarity consisted in this, that the commutators in each compartment of every carriage were protected, from the mischievous and idle, by being covered with glass, which had been found experimentally to be the best material for the purpose, as any opaque substance excited inquisitiveness, and therefore interference. The coupling used was an ordinary brass hook and galvanized iron eye, maintained in good contact by the pressure of a stout spring. It was divided into two parts, not only to provide for the reversal of the carriages, but to enhance the security of the couplings, from failure in electrical connexion, as experience had shown that a single coupling was not to be depended on. The author used the ordinary description of trembling bells, which continued to ring as long as the current was maintained, and which were equally applicable for any code of signals that might be determined upon. They were, however, specially constructed to prevent any emission of sound arising from the oscillation of the train. It was originally contemplated to provide an external visible semaphore, as well as an external electrical signal; but this had latterly been abandoned. In the system at present in practical work, there was free intercommunication between guard and guard, between the guards and the driver, and between the passengers and the guards. It had been found that no bell, however loud, could be heard upon the engine. The driver was therefore provided with a signal, which attracted his attention by a red disc by day, and a red light by night.

In conclusion it was stated, that the experience gained from the working of this system showed, that whatever difficulty existed in establishing a system of communication between the passengers and guard, was merely a mechanical one, and that any danger or inconvenience from placing such a convenience in the hands of the passengers was purely chimerical.

The discussion upon this subject, which was commenced, was adjourned until Tuesday, the 8th January, 1867.

SANITARY PROGRESS.

Nottingham.—The report of the sanitary committee of the town of Nottingham, for the year ending September 30th, 1866, has been issued in a printed form. The total number of deaths for the year was 2,007, or slightly under 24 deaths to 1,000 living persons. The chief causes of deaths were phthisis and bronchitis, and there was very little fever. Mr. Tarbotton, C.E., the corporation surveyor, has had constructed a new form of ashpits and privies combined, whereby the night-soil is covered in strata by the ashes from domestic fires, or by dust and earth, while rain is excluded and ventilation improved. Old ashpits and privies have been altered, and new ones built on this principle. Plans are given with the report.

Islington.—The report of the Sanitary and Diseases Prevention Committee appointed by the vestry on the 27th of July last has been read to the vestry by the clerk, Mr. John Layton, and printed for the vestry. It shows what measures were taken by the committee, and at what cost, for the prevention of the spread of cholera; and we have reason to know that these measures were successful. To the committee's report is appended that of Dr. Ballard, the medical officer of health, to whom the committee rightly acknowledge their obligations.

Reading.—The Reading local Board of Health have appointed Mr. Lawson, of London, engineer, in connexion with the proposed sewerage works of that town.

THE BOOLE MEMORIAL, AT CORK.

A memorial of the late Dr. Boole has been erected in the Queen's College, Cork, in which he filled the chair of mathematics. The memorial is in the form of a stained-glass window placed at the gable end of the examination-hall—a Gothic apartment. The design displays as in a series of tableaux, the leaders of science from the days when Grecian philosophers and Egyptian sages were laying broadly its foundation, down to modern times. The window consists of ten large compartments, each of which records some victory personified in the men by whom the triumph was achieved. The central compartment at the base contains the figure of Dr. Boole seated, bending thoughtfully over a volume in which he is writing. On either side stand Euclid and Aristotle, the grouping of these three figures indicating the character of Dr. Boole's principal work, "The Laws of Thought." The adjoining compartment on the one side is occupied by the forms of Pascal and Leibnitz and Descartes—representing modern metaphysicians and mathematicians. On the other side are

Bacon, Newton, and Napier. In the two remaining compartments of the tier—there being five in the breadth of the window—Hipparchus, Galileo, and Copernicus grouped together, represent astronomy; while Ptolemy and Strabo, with a third figure, indicate geography. The second tier contains five compartments, similar in size to those at the base of the window. The centre is filled with a representation of Fame seated, distributing wreaths of bay. This figure occupies the centre of the window, with a profusion of golden drapery as the prevailing feature. In the next compartment on one side Vasco de Gama, Columbus, and another recal the daring adventurers who explored unknown seas, and gave impulse to navigation. On the other side Hippocrates, Galen, and Harvey represent medicine. The extreme compartment at one side is filled by paintings of Archimedes and Phidias, grouping with two other figures, to indicate architecture, statuary, and mechanics; and in the last division King David, St. Augustine, and the proto-martyr Stephen are associated together, suggesting the conception of music and religion. The head of the window is filled in with the royal arms, St. George's cross, the Irish harp, and other devices. The inscription runs in a single line along the bottom of the window, so arranged that Dr. Boole's name comes immediately under his likeness. Blue forms the prevailing tint, but in the drapery green, yellow, purple, red, and graver hues are introduced.

NEW CHURCHES IN WALES.

St. Catherine's, Pontypridd.—On the 13th ultimo the foundation-stone of this church was laid by Miss Thomas, of Llwyn Madoc, in the presence of the Lord Bishop of Llandaff. The church will consist of nave, chancel, north and south aisles, and tower and spire. The north aisle is not comprised in the first contract. It will be constructed of Newbridge stone, with Bath stone dressings, and lined internally with red brick, banded in patterns of blue. The nave, which is 71 ft. 6 in. long, 24 ft. 9 in. wide, and 53 ft. high to the ridge, is separated from the aisles by arcades of five bays, supported by circular columns, over which is a clerestory of circular windows, with geometric plate tracery. In the west wall is a lofty four-light traceried window of noble proportions, and underneath is the western doorway, richly moulded, with banded shafts, carved caps, and moulded bases. The aisles are lighted with double and single light windows, with circles in the heads. The chancel is 35 ft. long by 22 ft. wide and 43 ft. high, opening from the nave by a lofty arch of brick and stone in consecutive rims, the subarch supported on coupled dwarf columns, the space over the arch being richly diapered with a cross enclosed in a circle, and other devices, the alpha and omega occupying the spandrels. The east window is of three lights, traceried. The vestry forms a transeptal projection from the south aisle of the chancel, with large circular window in the gable. The tower projects from the south aisle. It is of four stages, and 76 ft. high, and carries a spire 160 ft. to the vane. The tower forms the principal entrance to the church, through a richly-moulded archway, over which is a statue of the patron saint, in a canopied niche. Mr. Norton is the architect, and Mr. W. Morgan the builder. The cost will be about 4,000*l*.

Eglwys Oen Duw (the Church of the Lamb of God), Llwyn Madoc, Radnorshire.—This church, which has been erected from the designs of Mr. John Norton, at the sole cost of Miss Thomas, of Llwyn Madoc, was opened in November. It is built in the Early Pointed style, and is rectangular on plan, consisting of nave, 45 ft. by 17 ft. 10 in.; chancel, 25 ft. by 14 ft.; vestry, and south porch. The roofs are open throughout, and covered with blue and red Tunstall tiles. The stone for walling was from the Penybank quarry, with window and other dressings from the Lyde quarries, near Hereford. The crosses, cills, and copings are of Forest of Dean stone. The church internally is lined with Godwin's red bricks, diapered with glazed and encaustic tiles. The floor-tiles were also made by Godwin. A square timber bell-cot, covered with oak shingle, 70 ft. in height, rises from a double chancel arch. It contains a peal of four bells, by Warner, the gift of Mr. C. Thomas, of Cranmers. The pulpit stands in the groined space underneath, and is composed of rich ironwork by Leaver, of Maidenhead. An elaborately carved font, by Farmer, in Caen, red Mansfield, and Forest of Dean stone, stands in the porch entrance. The accommodation is for 120, and the cost about 2,000*l*. The builder was Mr. Mason, of Hereford.

Minera (North Wales).—The parish church of Minera has been re-opened after rebuilding, which has been completed, except the spire, by Mr. John Roberts, of Chester, as contractor, from a design by Messrs. Kennedy & Rogers, of London and Bangor, architects. The building, which is late Decorated in style, is a Greek cross on the plan, each of the arms being 20 ft. 9 in. by 18 ft. internally, the intersection of the cross consequently being 18 ft. by 18 ft., the length from north to south and east to west being respectively 59 ft. 6 in. There are, therefore, a chancel, north and south transepts, and a nave, with a detached tower in the angle formed by the south wall of the nave, and the west wall of the south transept. In the lower stage of the tower the outer entrance is placed. The chancel is lighted by a large east window of four lights, with arched head filled with tracery. This window has been filled with stained glass, by Mr. A. Gibbs, of London, at the cost of the Rev. R. O. Burton, as a memorial of his late father. Another window, with a segmental head, and having three lights, has been placed in the south wall of the chancel, opposite to which is a recess for a harmonium. The north transept is lighted by two windows—one in the north gable of three lights and one two lights in the west wall. The three-lighted window is filled with stained glass by the same artist as that in the east window, at the expense of the Minera Mining Company. The south transept has three windows—one in the south gable of a similar number of lights, and opposite to that in the north, and one each of two lights in the east and west walls. In the west wall is the entrance to the church from the inner porch which is lighted on both sides by a series of four small arch-headed windows. The roof at the intersection of the cross, as there are not any arches, has been framed to relieve the effect of the omission of this feature, and springs from carved clustered angle corbels of varied design. The remaining part of the nave forming the lower limb of the cross, is lighted by a west window in three lights without tracery, and one each of two lights in the north and south walls. The tower, which is 62 ft. high to the top of the four angle pinnacles, and finished so as to receive a spire, has three stories. Buttresses in two stages have been placed to all the external angles of the four limbs of the cross. The walls are of zigzag random rubble work, with stone dressings procured from the neighbouring quarries. The roofs which are divided into bays by principals resting on stone corbels, hereafter to be carved at the expense of several members of the congregation, are covered with Carnarvonshire slating, banded in two colours, and ridging of a similar material. The timbers and fittings inside are stained and varnished, the floors of the passages being of tiles. The church will accommodate about 350 persons, and has cost about 2,000*l*.

CHURCH-BUILDING NEWS.

Cambridge.—St. Matthew's Church, Barnwell, has been consecrated. The edifice is cruciform in plan, and consists of a nave and transepts, with a fully developed chancel, terminated by a semicircular apse. The angles of the walls at the junction of the nave and transepts, are splayed, so that the body of the church is in the form of a regular octagon, the roof of which is carried up to the height of about 40 ft., and terminated with an octangular clerestory or lantern with glazed quarry lights, above the heads of which there are eight trap-doors for ventilation, in addition to two more in the ceiling of the lantern; the whole of these doors are arranged in such a manner as to be readily opened from the organ-chamber at one time, by iron wheels, rods, and cranks. The vestry is built on the south-east side of the octagon, with a furnace-room below entered from the outside; and above it is the organ-chamber, access to which is obtained by a turret staircase from the lobby between the chancel and vestry. The walls are constructed of Cambridge white bricks, and are faced fair on both sides; the dressings, &c., are of red bricks from Haverhill, while the outer facing of the plinth is formed of Staffordshire blue bricks. The roofs are covered with Bangor purple slates, the great surface of which is relieved by the introduction of Welsh green slates, arranged in suitable patterns. There are no pillars nor other obstructions inside the building. The seats in the nave and transepts are of deal, fixed to cast-iron standards, while those in the chancel are framed, with bench-ends, and have moulded oak capping. Internally, all the timbers of the roof are exposed to view, and covered with wrought boarding and stained; the plates and tie-beams are illuminated with appropriate texts, and some of the rafters and other timbers and boarding in nave, transept, and lantern, have coloured patterns stencilled thereon; the chancel roof is more elaborately decorated, having blue ground to the whole of the boarding between the rafters, and studded with white stars as far as the commencement of the apse, while around the apse another feature (from ancient examples) has been introduced, viz., upon the blue ground are gold stars with mirrored centres to the larger ones, and at the apex of the rafters are gold rays, alternately straight and flowing, with the monogram I.H.C. illuminated thereon. All the staining and decorating were done by Mr. Leach. The church is to be lighted up by a large wrought-iron ornamental corona of about eighty burners, designed by the architect for the purpose, and which is being made by Messrs. Brawn & Downing, of Birmingham. The first contract was taken by Messrs. Bullock; the second contract by Mr. Mills, who has not yet completed his work. The lectern, pulpit, and prayer-desk of oak, and the sedilia of deal, were made by Messrs. Rattee & Kett. The glazing was done by Mr. Whybrow; and the ironwork to lantern, &c., by Messrs. Shallow & Coleman, who are making the hot-water apparatus, and work incidental thereto. The church will accommodate about 600 persons, the sittings are all free, and the total cost of the work (including site) will be under 2,000*l*. The architect is Mr. R. R. Rowe.

Books Received.

Useful Information for Engineers. Third Series. By WILLIAM FAIRBAIRN, C.E., F.R.S, &c. London: Longman & Co. 1866.

THIS is a very readable and interesting volume of Dr. Fairbairn's "Useful Information for Engineers." It comprises a miscellaneous series of lectures on the applied sciences, and on other kindred subjects, together with treatises on the comparative merits of the Paris and London International Exhibitions, on roofs, on the Atlantic cable, and on the effect of impact on girders. Some of these lectures had already been delivered and published in the Transactions of various societies and institutions.

VARIORUM.

"Blackwood's Shilling Scribbling Diary" has the advantage over that issued by other publishers, that it is interleaved with blotting-paper for a shilling. Blackwood's No. 4 is a well-bound Diary for the same sum.——"The Railway Almanack for 1867" contains, besides the calendar, an official list of the chairmen and executive officers of the independent lines of railway in the United Kingdom; with Government, postal, stock and stamp, public offices, and banking directories. It is a very useful sheet.——"The New Zealand Handbook," published by Stanford, is intended to afford information to all who may be looking for a new home. Proceeding from agents, its object is to induce emigration to New Zealand; but it seems, nevertheless, written in a fair spirit.——"Deane's Illustrated Almanack," though manifestly a business advertiser, includes a variety of quaint and amusing reading.——The January number of "Routledge's Magazine for Boys" contains the commencement of a new tale by the authoress of "East Lynne." How to make a Microscope for a Penny, and the Rev. J. G. Wood's paper on the Waves and their Inmates (both in this magazine), will please the boys by setting them to work.——A cheap volume giving the proceedings of the British Archæological Association for the Advancement of Science, at Nottingham, will be welcomed by many; and this has been published under the editorship of Wm. Tindal Robertson, M.D. (Forman, Nottingham; Hardwicke, London). It gives a very fair notion of the doings of the week.——The new number of the "Transactions of the Institution of Engineers in Scotland" consists of a paper by Mr. John Price "On the

Comparative Merits of the Rules of Lloyd's and the Liverpool Underwriters for the construction of Iron Ships." The essay is practically valuable.——"The Draytons and the Davenants; a Story of the Civil Wars," by the author of the "Chronicles of the Schönberg-Cotta Family" (Nelson & Son, Paternoster-row), should be called *the* story of the Civil Wars, showing the beginning of the quarrel, and ending with the "Petitions from the army for justice on the King." The fortunes and feelings of two families are mixed up with the progress of the events, and the story, from the Parliament point of view, is charmingly told, and holds the interest of the reader from the beginning to the end. The book can scarcely fail to be very popular.——"The British Almanac," with the "Companion to the Almanac," 1867 (Knight & Co.), maintains its place as head of the calendars, giving information of every sort needed in the library, the study, and the counting-house. Commercial Panics, the National Portrait Exhibition of 1866, Atlantic Telegraph Cables, and Mural Records of Pedestrian Tourists,—in other words, vagrant scribblings on walls,—are amongst the subjects that head interesting papers in the "Companion." It contains also the usual account of architectural works and public improvements.

Miscellanea.

Testimonial to Dr. Aldis.—On Wednesday in last week a testimonial, consisting of a silver goblet and salver, with a purse of 100 sovereigns, was presented to Dr. Aldis, by Frederick J. Farre, M.D., Censor of the Royal College of Physicians, and Senior Physician to St. Bartholomew's Hospital, on behalf of Dr. Aldis's professional friends and neighbours, as well as of several philanthropic noblemen and gentlemen. It was given with reference to Dr. Aldis's services as a sanitary officer, no less than as physician to a long string of public charitable institutions.

A new Light for Photographic Purposes.—A new light is proposed as a substitute for the magnesium light. It is thus described:—Nitrate of potash in powder, and well dried, 24 gms.; flour of sulphur, 7 ditto; red sulphuret of arsenic, 7 ditto. These three ingredients, being well ground together, the mixture, on being ignited, will yield a most powerful photogenic light; but 200 gms. of the compound are necessary to make the light last half a minute. The cost of the mixture is not more than 80 centimes per kilo., which would last two minutes and a half, while light from magnesium wire costs about 1s. per minute.

Stone-cutting Machine, Tyne Harbour Works.—For some time past machinery has been rather extensively used in the slate quarries of Wales, in cutting the rough material into slabs. These machines, the invention of Mr. George Hunter, of Carnarvon, have answered their purpose so well that their use is being gradually extended to quarrying purposes generally, and they promise to prove of much value to the engineer. The Tyne Harbour Commissioners have apparently come to the same conclusion, for they have had the machine, which we find illustrated by the *Engineer* journal, fitted up for their use, and it has answered their purpose so well that they have ordered another of colossal dimensions. The Newcastle machine is of the normal type, which consists essentially of two saw-blades mounted on a transverse shaft; and a traversing bed, much resembling that of a planing machine in its action, on which the block of stone or slate to be cut is fixed. The Newcastle machine is fitted with two 7-ft. blades of ¾-in. steel plate. The tools are set with a twist to right and left alternately; they cut 1¼ in. wide, at the rate of about 3¼ in. per minute. There are forty-four sets of tools, at a 6-in. pitch, in each blade, moving at the rate of 44 ft. per minute. The shaft is 12½ in. diameter, of cast iron, and 9 ft. long between standards. The stone is magnesian lime, and the rough blocks, as placed on the table, weigh up to seven or eight tons. The estimated horse-power consumed is between two and three. The second machine, now in course of construction, will be a two-bladed saw, each saw 13 ft. diameter. Each blade will carry sixty-eight tool-holders, the tools set singly and in pairs alternately. The larger number of the saws employed for cutting slate in North Wales have two blades, but several have been mounted with three and four blades, with 16 ft. between the standards.

Tunnelling Machinery.—Mr. Dering's tunnelling machine, now in the York-road, Lambeth, is small and compact. It is worked by means of compressed air; and the drill, when fixed in its socket, has both a forward and a revolving motion. The point of hardened steel is driven like a battering-ram against the surface of the rock with extreme force and rapidity, until a hole is made of sufficient depth for blasting. When once the hole is rounded, a depth of 6 in. is scooped out of granite in five minutes. Pulverization is assisted by a continuous jet of water directed into the hole, and the hole itself may be driven not only horizontally but at any angle. Its working, however, seems very expensive.

The Late Mr. Parkin Jeffcock.—At a recent meeting of the Society of Engineers, the circumstance was referred to that the late Mr. Parkin Jeffcock, whose noble conduct in endeavouring to save life at the recent colliery explosion had cost him his own, was an old member of the society. The following resolution was ultimately passed: "The Society of Engineers receives with sincere regret the announcement of the loss of one of its early members, in the person of Mr. Parkin Jeffcock, who met his death in the noble and laudable endeavour to save life at the recent fatal explosion at the Oaks Colliery, Barnsley; and the Society hereby begs to express its sympathy with Mr. Jeffcock's relatives and friends under their bereavement."

Government School of Science, Dublin.—The annual prizes and certificates to the students who had passed successfully the examinations for the session 1865-6, have been distributed by the Lord-Lieutenant, in the lecture-hall of the Museum, Stephen's-green, in the presence of a large and fashionable assemblage. The most distinguished of the students for the past year, it is said, was Mr. Frank Clowes, of London, who obtained the first prize (5*l.*) in geology, the first prize (5*l.*) in physical science, the first prize (5*l.*) in practical chemistry, and the second (2*l.*) in general chemistry. His Excellency expressed his gratification at the talent and research which had been evidenced both by the variety of the prizes and the large number of the competitors.

The London Water Supply.—At a meeting of the Inventors' Institute, held at No. 4, Martin's-place, Trafalgar-square, a paper, prepared by Mr. R. Hassard, C.E., on the future water supply of London, was read by Mr. Hemans. In this paper the scheme already noticed in our columns for the supply of the metropolis with pure water from the lake districts of Westmoreland and Cumberland, was again brought forward. A discussion ensued, during which it was declared by Mr. S. C. Homersham that there are 30 ft. or 40 ft. of mud at the bottom of Ulswater. In reply, Mr. Hassard stated that the water of Ulswater is of the most brilliant and pellucid description, and free from mud. In reply to an objection made to the open tunnel, Mr. Hassard stated that the tunnel could be covered if necessary, but he thought the water would be improved by the tunnel being open, running water having the power to purify itself in the open air.

Armour-plated Vessels.—In a lecture delivered at the Plymouth Mechanics' Institute, a few days ago, Mr. Reed, the chief constructor of the navy, said that the unfair and perpetual depreciation of our ships had caused a loss of public confidence; but it was not true that English ships were inferior. The *Warrior*, in spite of some imperfections, was a magnificent ship, well adapted for performing ocean service in the interests of commerce. The *Achilles* was splendid as regards some of the most important qualities of a man-of-war, but she, too, of course, had her drawbacks, the greatest of which was her extreme length, and consequent unhandiness under steam; and the *Bellerophon*, for this reason, on account of her thicker armour and having heavier guns, was preferable to her as an engine of war, although costing 100,000*l.* less. These ships were not failures nor anything resembling failures. He said we ought to build some ships upon the turret principle, neither purely on the American plan nor purely on Captain Coles's, but embracing the best points of both; to carry armour 15 in. or 16 in. thick, and 20-ton guns; and to steam at fifteen knots. The ship which he described as "by far the most powerful iron-clad yet built in this country" is not one of her Majesty's fleet, but a ship called the *Fatikh*, built for the Sultan, and subsequently purchased by the Prussian Government.

St. Nicholas's Steeple, Newcastle-upon-Tyne.—The committee of management for the long-required restoration of this steeple have at length resolved to advertise for tenders on Mr. G. G. Scott's specification. The subscriptions now amount to 2,264*l.*

Opening of the New Vestry-hall of St. Luke's.—The new hall, erected in the City-road, for the members of the Vestry and Guardian Boards of St. Luke, has been formally opened by a banquet given by Mr. Churchwarden Wilson, in the Vestry-hall. About 120 gentlemen were present.

The new Infirmary, Macclesfield.—10,000*l.* being now subscribed towards the building fund, immediate steps are to be taken to obtain the requisite plans and designs for the proposed infirmary. The architect is Mr. Stephens, and a sub-committee has been formed to consider the designs, and to visit other infirmaries.

Prison: Cork.—At a meeting of the commissioners of the county of Cork gaol, held on Friday, the 21st of December, Mr. James Newstead, builder, of Fermoy, was appointed contractor for the works connected with the alteration of the prison, to suit the requirements of the system, under Mr. William Atkins, architect.

New Museum of Science and Art.—It is stated that the Government have consented to propose in the coming session a vote of 20,000*l.* for a museum of science and art for the East-end of London. The consent of the trustees of certain poor lands in Bethnal-green to sell a portion for the site of a museum has, it is said, been obtained.

The Late Mr. Charles Reeves, Surveyor of the Police and County Courts.—Mr. Reeves, whose death occurred on the 6th inst., was the architect, in conjunction with his partner, Mr. Butcher, of many of the county courts, both in London and the chief towns of England, as well as of many of the metropolitan police stations. Substantiality is their chief characteristic.

Want of Lunatic Asylums.—The *Lancet* says that the three large asylums for the county of Middlesex are full, and that extended accommodation for the insane poor, not, however, from any abnormal excess of cases, is urgently required all over England. The subject is now under the serious consideration of the Commissioners in Lunacy, who will advise the Home Office.

Archæological Remains on Dartmoor.—Some fresh Celtic remains have been recently discovered on Dartmoor. The foundations of an aboriginal village of some fifty dwellings have been uncovered, and slabs of stone have been found having depressions on their surfaces—believed to have been intended for making castings in metal. The high land of Dartmoor seems to be a promising field for the discovery of rock carvings.

Danish Sculpture.—We are informed that the Danish sculptor, Prof. Jerichau, is at present in Rome engaged in executing in marble three groups, all of which are destined for England. The first, the bridal gift of the large landowners of Denmark to the Princess of Wales, and a cast of which is at Marlborough House, represents Adam awakening and finding for the first time Eve by his side; the second, Women surprised while Bathing, has been ordered by the Princess of Wales; and the third, a Huntsman attacked by a Panther whose Cub he has taken, by Sir Francis Goldsmid. A cast of this work of art was exhibited in the Exhibition of 1851.—*Athenæum.*

TENDERS

For addition to a warehouse, Love-lane, City, for Messrs. Baggallay, Westall, & Spence. Mr. Herbert Ford, architect. Quantities by Mr. J. W. Dennison:—

Newman & Mann	£5,965 0 0
Browne & Robinson	5,960 0 0
Adamson & Son	5,940 0 0
Brass	5,857 0 0
Ashby & Horner	5,810 0 0
Henshaw (accepted)	5,795 0 0

For two houses, at Addiscombe. Mr. H. W. Broadbridge, architect. Quantities not supplied:—

Ponton	£1,370 0 0
Dover	1,000 0 0
Hargreaves	875 0 0
Surridge	853 0 0
Ward	850 0 0
Standen	835 0 0
Vickery	800 0 0
Collier	736 0 0
Randell & George	620 0 0
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